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XXV.—*Expedition to the North-West Coast of Australia.*

By F. T. GREGORY, Esq., F.R.G.S.

Communicated by the COLONIAL OFFICE.

Read, February 10, 1862.

Perth, November 18, 1861.

April 20th, 1861.—All the preliminary arrangements in Perth having been completed, and the stores and equipment of the Expedition already sent on board the barque *Dolphin*, I proceeded to Fremantle, and shipped the 10 horses that had been furnished by the settlers in this part of the colony; the remainder of the hay and water being also completed by 2 P.M., we were prepared to sail, when the agent for the vessel raised objections to our departure, on the plea that the arrangements for the payments on account of the charter were not satisfactory. Wrote accordingly by express to the private secretary for an acknowledgment that the requisite documents were complete.

21st.—Received reply from the private secretary to the effect that everything necessary had been approved of already by the Governor; the agent would not, however, allow the vessel to leave until he had actually received the first instalment on account of the charter from the Colonial Treasurer.

22nd.—Accompanied Mr. Manning and Captain Dixon to Perth, when they were informed by the Colonial Treasurer that the money would be forthcoming on the presentation of the accounts. Returned to Fremantle, where we were detained for the remainder of the day, to enable the agent to close his accounts.

23rd.—Went on board the *Dolphin* at 7 A.M., and by 11 got under weigh, with a fresh breeze from the E.N.E., and stood to the N.N.W. The portion of the exploring party embarked at Fremantle comprised the following persons:—F. T. Gregory, Commander; J. Turner, Assistant and Storekeeper; E. Brockman, W. S. Hall, and J. M'Court, Assistants; and A. James, Farrier. Supplies of flour, salt pork, dried beef, preserved meat, bacon, sugar, tea, &c., sufficient for eight months, were provided for a party of 9; 3 more volunteers and 10 horses having yet to be taken on board at Champion Bay.

24th.—Light winds from the north; at noon sighted land, in lat. 31° 28' 12" south; all hands attending to horses.

25th.—Experienced variable and contrary winds; made but little progress.

26th.—Weather cloudy, winds unfavourable; had a distant view of Mount Lesueur.

27th.—Sighted Mount Hill soon after daylight, rain and squalls







rendering it difficult to distinguish the coast. The weather clearing up, ran into Champion Bay, and came to anchor by noon, $\frac{1}{2}$ mile north of the jetty, in 4 fathoms. Landed and procured a horse from the Government Resident, and rode out to Mr. K. Brown's station.

28th.—Procured a horse for the Expedition from Mr. W. Moore, on account of Hamersley and Co., and returned with it to the Bay.

29th.—Sent round to the rest of the subscribers of horses to the Expedition. Party employed filling up ship's water-tanks.

30th.—Mr. J. Harding arrived, as a volunteer, with 2 horses from Mr. W. Burges; also Mr. M. Brown, as a volunteer, with 1 horse. The following gentlemen also sent horses:—Messrs. J. S. Davis, 2; F. Du Boulay, 1; C. Von Bibra, 1; H. Gray, 1; M. Morrissey, 1; and J. Drummond, 12 sheep. Mr. P. Walcott joined as a volunteer for the collection of specimens of natural history and botany. Ship's crew employed discharging the remainder of the cargo from England, consigned to Champion Bay.

May 1st.—With the assistance of a number of gentlemen who kindly volunteered their aid, the 10 additional horses were safely swam off to the *Dolphin*, Captain Dixon and his crew being employed landing a steam-engine. Wrote to his Excellency the Governor, reporting intention to sail to-morrow.

2nd.—Wrote to Dr. Norton Shaw, of the Royal Geographical Society, reporting progress of the Expedition. Transferred order for 20 sheep, subscribed by J. Williams, to Mr. T. Burges. Took on board 12 sheep sent by Mr. Drummond, and closed accounts at the Bay. Party fitting up mangers, &c. At 5 h. 30 m. P.M. got under weigh and stood to the north-west, the soundings for 5 miles varying from $3\frac{3}{4}$ to 7 fathoms; the sea breaking heavily for about a mile in a north direction from the end of the sheltering reef, showing a much greater extent of shoal-water than is noted on the charts. Established a routine of watches of two hours each, for the members of the Expedition to attend upon the horses.

3rd.—By observations at noon found the latitude to be $26^{\circ} 53' \text{ s.}$, long. $112^{\circ} 33' \text{ E.}$ Party preparing equipment, drying horse-slings, &c. Wind light from south-east.

4th.—Putting pack-saddles together, covering water-belts, &c.; light wind from south, ship making from 1 to 4 knots; course north by east. Increased allowance of water to horses from 4 to 5 gallons each, on account of the heat of the hold. Killed a sheep. Lat. at noon $25^{\circ} 40' \text{ s.}$, long. $112^{\circ} 1' \text{ E.}$

5th (*Sunday*).—Held Divine service. Passed through several drifts of seaweed at noon, in lat. $25^{\circ} 43' 34'' \text{ s.}$, long. $112^{\circ} 5' \text{ E.}$;

showing a southerly current of nearly 2 miles per hour; cloudy, with light winds from south-east and south.

6th.—At noon sighted Cape Cuvier, bearing east 20 miles; lat. $23^{\circ} 52'$, long. $112^{\circ} 53'$ E.; current of 19 miles south in 24 hours.

7th.—North-west Cape was visible at noon, bearing E. $\frac{3}{4}$ N., distant 25 miles, our lat. being 22° S., and long. $113^{\circ} 18'$ E. The Cape appears to have an elevation of 500 or 600 feet, and to be of a sandstone formation; the soil back on the hills appearing good, and clothed at this period of the year with an abundance of grass, wattles of large growth, and flooded gum-trees growing on the slopes; the character of some of the lower hills and valleys is that of a mineral district.

8th.—Passed through many patches of drifting seaweed coming from the eastward. Light south-east winds and cloudy weather. Lat. $20^{\circ} 24'$ S., long. $114^{\circ} 37'$ E. at noon.

9th.—Richie's Reef cannot be in the position shown on the charts, as we sailed over it, and saw no broken water. At noon found our lat. to be $19^{\circ} 58'$ S., and long. $115^{\circ} 23'$ E.; light winds from the south-east, and a current of $\frac{1}{2}$ mile per hour setting to the west or north-west.

10th.—At daylight sighted Legendre Island to the south-east, distant 10 miles. Ran E.N.E. till 10 A.M., with fresh breeze; tacked to south-west, with wind at E.; by noon it fell calm, having fetched to within 10 miles of the north end of Delambre Island. At 5 P.M. a light wind from the north-west enabled us to run in and drop anchor at 6 in 13 fathoms, the south end of Delambre bearing east, about 3 miles; at 11 a strong breeze sprang up from the south-east, freshening to a gale by 2 A.M. of the 11th. Tide setting to south-west, at 4 miles per hour, with a rise of 16 feet.

11th.—The gale continued to 11 A.M., when it moderated, the tide being full at about noon. Got under weigh at 1 P.M., and stood to the south-west, under top-sails, stemming a strong ebb-tide to 3 h. 30 m. P.M., when we came to anchor in 5 fathoms (sand and shells), about 3 miles from the western shore of the bay, Sloping Head bearing north by east 5 miles. The water of the bay is much discoloured, being of a deep reddish brown. In passing down the shore, we observed that the whole of what is shown on the charts as a promontory, extending to the north of Sloping Head, is an island, with a channel nearly half a mile wide, separating it from the main; to the outer portion was given the name of Dolphin Island. At 4 P.M. left the ship in the life-boat, accompanied by Captain Dixon, Mr. Hall, and 4 men, and took soundings for 6 miles to the south-west down the centre of the bay, finding 5 and 6 fathoms all the way; the water then shoaled to 3 fathoms, when, being within a mile of the head of the bay, it

became dark. Pulling about 2 miles to the south-east, it gradually shoaled to 1 foot, when we grounded, and remained there till 11 P.M., when, the tide being at the full, we pulled for the ship; but not seeing her lights by 1 A.M. on the 12th, and the men being much fatigued, we lay on our oars for an hour, and then took a stretch for 2 miles to the S.S.E., to get under the shelter of the south-east shore of the bay, when, having no anchor, we lay-to till daylight, by which time the boat had drifted into heavy rollers under the high rocky land at the south-west head of the bay; the wind having risen so much that the boat was only kept afloat by keeping her head to the sea. As we could not observe any spot at which we could land without the risk of swamping the boat and wetting our fire-arms, we continued pulling towards the ship, the ebb-tide assisting us, until 2 P.M., when, just as all hands were becoming thoroughly tired out, a boat was sent from the *Dolphin* to our relief, with a timely supply of biscuit and brandy, which, with the assistance of a tow-line, enabled us to reach the ship by 3 P.M., very thankful that we had escaped what at one time appeared likely to have proved a serious disaster.

13th.—In the morning it blew so fresh from the eastward that Captain Dixon did not like to move the vessel until 2 P.M., when we stood to the south for about 4 miles, and came to anchor in 4 fathoms. Taking the life-boat and cutter, both well manned, we pulled south to the shore about 3 miles, the water gradually shoaling, until at half a mile from the shore the boats grounded on a sand-bank, from which we walked, through mud, shells, and coral, to a belt of mangroves about 50 yards through, behind which rose a sand-bank about 30 feet high, covered with flowers and coarse grass. From this to the foot of a range of rugged metamorphic sandstone, a distance of half a mile, was an open, undulating, loamy plain, covered with grass just arriving at maturity, a few small wattles, hakea, and white gum-trees. As the sun had now set, we had only just time to ascend a few hundred feet up the rocky ridge, from which elevation could be discerned a sheet of water about a mile to the eastward, which we attempted to reach, but it became so dark that it was found better to return to the boats, which were now high and dry. By 8 P.M. the tide had risen sufficiently to admit of Captain Dixon's return to the *Dolphin*, while I remained with a portion of my own party to make a further examination in the morning; the leaky state of the cutter keeping one of us baling through the night.

14th.—With Messrs. Turner, Brown, Harding, and Brockman, landed at 7 A.M., and walked to the sheet of water observed last night, but found it only a tidal inlet, terminating in a salt-marsh. Continuing on our course for 5 miles to the south-east, across a grassy plain, the soil being a light-brown loam, with occasional

patches of quartz and gneiss pebbles, and beds of limestone in irregular nodules, in an hour and a half arrived at a deep stony water-course, containing some small pools of brackish water. This stream was followed up to the southward about a mile, but found to be dry, and did not appear to come from a greater distance than 20 miles. This river was named the Nickol. The country to the south not being very promising we turned to the westward, recrossing the plain more to the south, passing several hollows, in which the rain-water had very recently rested, leaving a rich alluvial deposit, from which had sprung up a splendid sward of grass, which was still quite green. Not meeting with water in this direction, and the party not being yet in full training, we were glad to return to the boat, which was reached by 2 P.M. ; the tide being now in, enabled her to come in close to the beach, the rise being found to be about 16 feet. By 5 h. we had returned to the ship, all tolerably well fatigued with our first day's march on shore.

15th.—Not being satisfied to land the horses on a shore devoid of water, I determined to attempt a landing in a small sandy cove in the high rocky shore on the west of the bay, which we had been afraid to enter during the gale on the 12th. Leaving the ship with two boats and provisions for the day, we pulled for the little cove about 4 miles distant, bearing west by north. For the first 3 miles the soundings did not show less than 3 fathoms, with an even sandy bottom, the last mile shoaling gradually to the beach ; the landing being easily effected, as there now was but little surf. The shore was found to be generally very sandy, a low flat valley extending from the head of the cove across the isthmus about 2 miles to Mermaid Strait, where it terminated in a muddy mangrove creek. In about half an hour several wells were found, some containing rather brackish water ; but one, about 8 feet deep, in a hollow under a steep range of bare volcanic and granite hills, not more than 200 yards from the beach, was found to contain an abundant supply of good water, grass being plentiful and of fine quality in the valleys under the hills. Our principal requirements being now satisfied, it only remained to bring the ship in near enough to land the horses. On our return to the *Dolphin* we found that she had been visited by two natives, who had paddled off on logs of wood, shaped like canoes, not hollow, but very buoyant, about 7 feet long and 1 foot thick, which they propelled with their hands only, their legs resting on a little rail made of small sticks driven in on each side. At first they were afraid to come on board, but on friendly signs being made, they ascended the ladder that had been put down for them. They were both fine looking men, of about forty years of age, above the middle stature, one measuring 6 feet 4 inches, and the other 5 feet 8 inches ; their hair straight and black, teeth regular, and general features characteristic of the tribes on

the west coast; their bodies were rather more spare, and had not on them a vestige of clothing. The Champion Bay dialect was quite incomprehensible to them; they, however, knew the use of both biscuit and tobacco, some of which was given them. After remaining several hours on board, they took their departure for the eastern shore of the bay, distant at least 6 miles, promising by signs to repeat the visit the next day. It is worthy remark that neither of these natives were circumcised, or had lost the front tooth, as is common on this coast farther to the eastward. Their fearlessness and confidence in the good faith of Europeans would lead to the impression that this was not their first acquaintance with vessels on the coast. It was not far from this place that Captain P. P. King had a visit from natives similarly equipped more than forty years ago. While on shore to-day several new and very beautiful plants and flowers were observed, amongst them one in particular, which, without exception, is the handsomest shrub I have ever seen in Australia: in form the plant resembles a large chandelier, with a series of branches springing from a centre stem in sets of five each; on these are short erect stems a few inches apart, carrying five beautiful deep crimson dragon flowers, nearly 3 inches in length, grouped like lustres, producing a very gorgeous effect; the leaves of the plant are elegantly formed, like those of the mountain-ash, and are of a rich green. A purple flowering bean, the seeds of which are the size of the English horse-bean, is here found in abundance, and is eaten by the natives. Melons similar to those formerly seen by me on the Gascoyne, several varieties of brachychiton, a small variety of the Adansonia, three or four different kinds of convolvulus (one of which runs along the sands near the beach with arms sometimes as much as 40 yards in length), acacias, sterculia, and a variety of eucalyptus resembling a stunted red-gum, are also found growing among the hills in small quantities.

16th.—Early this morning the *Dolphin* was moved to within 3 miles of the cove visited yesterday, and anchored in $2\frac{1}{2}$ fathoms at the lowest water, the landing-place bearing west by north. By 11 A.M. the first pair of horses were hoisted out and placed in the water under the counter of the cutter; two other boats assisted in towing us to the shore, which occupied about an hour; the horses, on landing, being scarcely able to stand, from the length of time they were in the water. On reaching the beach a serious accident occurred to Mr. Hearson, the second mate of the vessel, resulting from the negligence of James, the farrier, who, notwithstanding my repeated cautions to all the members of the Expedition to keep snappers on the locks of the guns, had omitted to do so, in consequence of which, on his gun being handed out, the hammer caught on the gunwale of the boat and discharged a ball through both the

hips of the mate, causing him to fall in the water, which circumstance fortunately tended materially to stop the hemorrhage: he was immediately carried to a sheltered spot, and a tent pitched over him. On examining the wound I found the ball had entered the right posterior, passing close below the joint, and, taking an oblique direction through the lower edge of the pelvis, made its exit in front of the left thigh, between the femoral artery and the principal tendon, without injuring either. This mishap, and the freshening of the breeze, prevented our landing any more horses to-day, the remainder of it being spent in making a camp and attending to the comfort of our wounded companion, who occasioned me some anxiety, as the treatment must entirely devolve upon myself, who possessed but a very limited amount of experience in matters of this nature.

17th.—Four more horses were safely landed this morning, and we were returning to the vessel for another pair, when a party of fourteen natives made their appearance at the camp. At first they came boldly up, but on a gun being discharged as a signal for my recall, they appeared much alarmed, although they would not go away. Our numbers being small, I determined not to allow them to enter the camp, on account of their propensity to thieving, and the few that could now be spared to guard the stores were insufficient to keep a constant watch on their stealthy movements: I therefore tried at first to make them understand that we had taken possession for the present, and did not want their company; they were, however, very indignant at our endeavours to drive them away, and very plainly ordered us off to the ship. It was very evident that our forbearance was mistaken for weakness, and that mischief was preparing. I accordingly took hold of one of the most refractory and compelled him to march off at double-quick time, when they all retired to some rocky hills overlooking our camp, from which it was necessary to dislodge them. Taking Mr. Brown with me, we climbed the first hill, which made them retreat to the next. Resting ourselves for a few minutes, and taking a view of the surrounding country, we were just on the point of returning to the camp, when we observed three armed natives stealing down a ravine to the horses, evidently with hostile intentions, as they shipped their spears on getting close enough to throw; we did not, however, give them time to accomplish their object, as we ran down the hill in time to confront them, on which they took to the rocks. Seeing that it was now time to convince them we were not to be trifled with, and to put a stop at once to what I saw would otherwise terminate in bloodshed, we both took deliberate aim and fired a couple of bullets so close to the principal offender, that he could hardly escape feeling the effects of the fragments of lead as they split upon the rocks within a few feet of his body. After dark it set in to rain heavily

for an hour, when lights were observed moving in the direction of our horses, but the sentries being on the alert, no further attempt was made to molest us.

18th.—Two more horses were landed this morning, but rain setting in from the north-west, with a strong easterly wind below, a stop was put to landing any more to-day.

19th (*Sunday*).—It had rained both heavily and continuously during the night, but as our tents were good we did not experience much inconvenience from it, and it gave a fair prospect of finding a good supply of water on our contemplated trip into the interior. Mr. Hearson's wound was progressing favourably, and I was in consequence enabled to go off to the ship and procure a few additional comforts. On our return two more horses were brought ashore, reducing the number on board to one-half.

20th.—We succeeded in landing six more horses during the day; the great distance they had to be swam ashore made the process very slow and fatiguing, some of the horses being scarcely able to stand for some time after landing. This morning I made a rough survey of the cove and surrounding hills, and while so employed observed seventeen natives pass across the shoals at low water, carrying nets, but no weapons: they did not appear to fear us, or inclined to come up to the camp, nor did we offer them any encouragement, as in the present exposed state of our camp they would have been very troublesome.

In the evening Mr. Brown and myself rode across the isthmus to Mermaid Strait, and found it to form a very fine and romantic-looking little harbour, surrounded by a bold rocky coast, giving it much more the appearance of an inland lake than an open strait. I have no doubt that it would afford an excellent harbour; there is, however, reason to think it is equally difficult of access from the main, with the cove upon which our camp is, as a wide expanse of marsh land appears to extend all round behind the hills that bound it to the southward.

21st.—The last four horses were landed this morning, as also the instruments and remainder of the stores required for our first journey. The farrier, with two assistants, was kept busily employed all day shoeing horses.

22nd.—The forge was in full employ during the day, and great progress made with the shoeing and preparations for our departure. Accompanied by Mr. Brown, I rode out to-day to reconnoitre and seek for a place through the hills that encompassed our camp: the only practicable outlet we found to be through some very rocky ravines to the south-west, where at about 5 miles we found, what I had for some time suspected to be the case, that the whole of the isthmus upon which we had landed was cut off from the main land by an extensive salt-water marsh, commencing at the bottom of

Nickol Bay and running parallel to the general line of coast, at least as far as Enderby Island. Skirting the northern edge of the marsh for several miles to the westward, we found it gradually getting wider and deeper; we accordingly returned to the narrowest part, and rode into it for about half a mile, the water being very shallow and the bottom sufficiently firm to carry us, although with considerable labour to the horses. Finding it was getting late, we determined to try and return to the camp round by the head of Nickol Bay, and succeeded in climbing over the rocks and boulders that encumber this portion of the coast, until we were within a quarter of a mile of the camp, when the tide came in upon us so quickly that, after having been repeatedly thrown down by the surf, we were compelled to leave the horses jammed up in the rocks just above high-water mark, and proceeded on foot to the camp.

23rd.—At 3 A.M., the tide having fallen sufficiently, Messrs. Brown and Harding were enabled to bring in the horses left imprisoned last night. During the day all the arrangements for our departure were completed, and in the afternoon Mr. Hearson was removed to the *Dolphin*, having been kept on shore since the accident, to be constantly under my own attendance; he was now rapidly recovering, although much reduced. Wrote instructions for the guidance of Captain Dixon and Mr. Walcott during the absence of the expedition, the latter gentleman being left in charge of the stores and to make such observations as the means at his disposal should admit of.

24th.—Landed at daylight, intending to make a start, as it was the Queen's birthday; but owing to some of the horses having rambled we did not succeed in getting them all in and saddled up before 2 P.M., when three or four of the horses that had not been accustomed to carrying packs commenced playing up and scattering their loads in all directions, straining and otherwise injuring several of the packsaddles, which detained us until so late in the day that I deemed it best to return to camp, and, as the forge had not been removed to the ship, to shorten some of the saddle-irons, to render them less liable to injury, which was otherwise a great improvement.

25th.—The re-adjustments having been satisfactorily accomplished, we made a fair start this morning by 9 A.M. and arrived on the edge of the marsh by 11 h. 30 m., where, having first taken a survey of the several channels from the summit of a high granite hill, we entered the waste of mud at a point where it did not appear to be more than 2 miles wide; an hour's struggle carried us fairly through on to *terra firma*, only one horse having to be assisted by the removal of his load. After resting an hour and a half for dinner we resumed our route in a south direction, across an extensive low grassy plain of red clayey loam, passing over a few rocky

ridges at sunset, and at 6 P.M. encamped on a dry creek 20 yards wide, water being found in some clay pans in the adjoining plain. (*Camp 2.*)

26th.—Being Sunday, the camp was only moved a mile farther to a fine pool of water in a river 80 yards wide, with beautiful grassy banks, which I named the Maitland: it comes from the south-east, and may probably have a course of 60 miles, coming through a plain 5 or 6 miles wide, the greater part of which is occasionally inundated by floods from the interior. Cockatoos and other game were plentiful, sixteen of the former being killed by Mr. Brockman at one shot: they were white, with orange-tinted feathers in the crest, similar to those on the Murchison and Gascoyne rivers. It may be as well here to observe that upon first starting a regular routine of duty had been established in the party, the care and loading of five horses being told off to each two of the party, as they could lift on opposite packs simultaneously; and their being all numbered, every one could at once know the loads under his charge. The night was also divided into eight watches, commencing at 8 P.M. and ending at 6 A.M.; the duty of the first watch being to cook the bread for the following day, and the last to have breakfast ready in the morning by the time it was light enough to see. By this arrangement no time was lost, and every one knew what was under his particular charge. (*Camp 3.*)

27th.—Having determined in the first instance to strike to the westward, with a view to cutting any large rivers coming from the interior that might serve to lead us through the rocky hills that hemmed us in in that quarter, we this morning took a s.s.w.* by s. course to 11 h. 40 m., when we crossed a dry stream-bed, 60 yards wide, coming out of the granite ranges to the southward, the country becoming more barren as we edged upon the spurs of the rocky hills. At 2 P.M. we halted on the banks of another stream-bed of the same size as the last, when it came on to rain; resuming our march at 4 h. 10 m., steering west to 6, when we encamped on a dry gully, with a little feed near it. Having pitched the tents, it continued to rain until 11 P.M., when a sudden rush of water swept down the valley, filling the watercourse and carrying away our fire; and before we had time to remove the baggage to higher ground, we had a foot of water in the camp. Fortunately nothing was lost or injured, and it only served as a useful lesson for the future. (*Camp 4.*)

28th.—The early part of the day was employed drying the stores, so that we did not make a start until late. Four-and-a-half hours' travelling over stony country, principally covered with triodia, but containing several patches of good grass, brought us to another river, 50 yards wide, in which were a few pools. This stream was followed up to 5 P.M., when we left it, and halted on

an open plain close to some shallow clay-pans containing rain-water; our course for the day having been about south-west 11 miles. (*Camp 5.* Lat. $21^{\circ} 7'$.)

29th.—By an azimuth of the sun's centre taken this morning, the magnetic variation was observed to be about $20'$ west. Steering N. 230° E. mag. soon brought us out of the hills into a plain extending as far as the eye could reach to the north-west, with a few patches of good grass upon it, but mostly covered with triodia, which was now just ripe, yielding fine heads of seed, which the horses are very fond of. At 13 miles struck the channel of a considerable river coming from the south. As this offered us a fair prospect of working inland, and we had already attained nearly to long. 116° , or about the meridian of the mouth of the Alma, the stream was followed up for an hour, its average breadth being over 200 yards. At 4 h. 40 m. encamped at a fine spring on the bank of a deep pool, under a cliff of metamorphic sandstone nearly 300 feet high; a cane, much resembling a Spanish reed, growing in considerable quantities near the water. (*Camp 6.* Lat. $21^{\circ} 18'$, long. $116^{\circ} 4'$.)

30th.—Soon after starting this morning, we came upon a camp of 15 or 20 natives, on the bank of a deep reach of water, hemmed in by steep rocky hills, up which they hastily scrambled on our approach, and on reaching the summit, tried by various gestures to express their disapproval of our visit, but would not hold any parley with us. At 5 miles the river turned abruptly to the north-east through a precipitous rocky defile, which induced us to make an attempt to cut across and strike the river some miles higher up; but after being for some time involved in impracticable ravines, we were again obliged to have recourse to the bed of the river, although incumbered with beds of large stones, over which the horses had great difficulty in travelling; so that by sunset we had not accomplished more than 6 miles in a direct east-by-south line from last night's camp. (*Camp 7.* Lat. $21^{\circ} 19' 29''$.)

31st.—The general course of the river during to-day was very little to the south of east, its banks still maintaining the same rocky and precipitous character, marks of inundation being frequently observed at the height of 30 feet above the present stream, which now was only running gently in a channel not more than 30 yards wide, but when in flood occupying the whole of the valley, which averages a quarter of a mile in width. The larger pools are lined with flags and reeds, and contain numbers of small fish, resembling trout, similar to those found in the Lyons and Gascoyne rivers. A very handsome tree, resembling an ash, grew on the margin, bearing a beautiful white flower, 4 to 5 inches across, having on the inside a delicate tinge of yellow, and yielding a sweet scent like violets. Several natives were met in the course

of the day, but would not come near us; in one instance, however, we came upon one so suddenly, that he had only time to jump into a pool to escape being surrounded by the party. After calling for some time most lustily for his friends, he gradually crept away amongst the canes and disappeared. Only one tributary of any size was observed to join the river in the course of the day's march, and that came in from the southward. At 5 h. 20 m. P.M. halted on the banks of a deep pool, surrounded by fine cajeput-trees and flooded gum, grass being plentiful for our horses. (*Camp 8.*)

June 1st.—There was a decided improvement in the appearance of the valley as we continued to ascend the river: the deep pools were more continuous, and grass more abundant; the high lands on either bank still, however, retained their rugged outlines, and were clothed with little else but triodia. Travelling along the bed of the river was nevertheless difficult and dangerous for the horses, on account of the immense quantity of rounded boulders of water-worn rocks that occupied a large portion of the channel, and frequently jammed the horses into narrow passes, where they could not be extricated without meeting with very severe falls, which very soon crippled more than one of them; their shoes also began to be wrenched off by being caught in the deep clefts of the rocks, very soon expending all the extra sets brought with us. Just before coming to our night's halt a large stream-bed, 40 yards wide, was observed to come in from the southward. (*Camp 9.* Lat. $21^{\circ} 28' 18''$, long. $116^{\circ} 31'$ by account.)

2nd (Sunday).—Having abundance of feed and water, we gladly availed ourselves of it, to make it a day of rest; it also afforded me an opportunity to ascertain the rate of the chronometer, which, as I had reason to expect, had gone very irregularly since landing.

3rd.—Made an early start, and as the valley of the river was not quite so rugged as that we have passed over during the last two or three days, by noon we had accomplished about 8 miles, the course of the river still being very little from the southward of east; we had not, therefore, made much progress towards the Lyons river (our more immediate destination), and to quit the valley was out of the question, as there is no feed or water out of it, within a reasonable distance. Both the valley and surrounding country are destitute of trees, and bold hills of metamorphic sandstone frequently jut out into the valley and terminate in perpendicular cliffs 200 or 300 feet high. Towards the evening the river had been coming from the northward of east. (*Camp 10.* Lat. $21^{\circ} 27' 48''$.)

4th.—During the forenoon the river became much hemmed in by steep rocky hills, the bed being a succession of rapids, over a

bare rocky channel ; but after the noon-halt the stream came more from the south-east, with wide grassy flats on either side, in many parts very boggy, and producing *Melaleuca leucodendron*, with tall straight stems, and a variety of eucalyptus, resembling *E. piperita*. White sandstone and shales began to make their appearance on the banks, and the water in the river had a saline taste. Several of the horses began to show signs of being much distressed, by falling and sticking fast in the mud, from which they had not strength to extricate themselves, even after being relieved of their loads. Ducks were plentiful and tolerably tame. (*Camp 11. Lat. 21° 33' 55"*, long. 117° 2' by account.)

5th.—Having marked a large double-stemmed gum-tree with N A E and the date, we made a start up the river, but at about a mile found the valley narrow in until the channel of the river, which was here full of water, was walled in on both banks by perpendicular cliffs, from which we were compelled to turn back nearly to our last night's camp. During the last two days we had caught an occasional glimpse of an elevated range of hills extending for many miles parallel to the river and about 10 miles to the southward, which rendered it probable that some change would now be found in the character of the back country, enabling us to travel without being so frequently retarded by the rocks and bends of the river. A suitable spot was accordingly selected for ascending out of the valley, which was accomplished with some difficulty, when the country was observed to be intersected for many miles by deep ravines, terminating, however, to the south in a level plain, extending to the base of the range already referred to. After four hours' heavy toiling, we at length reached the summit of the plain, water having been found in one of the rocky gullies by the way. For the first half mile, on entering the plain or table-land, the ground was stony and covered with stunted acacia, but it very quickly changed into a rich clayey loam, yielding a splendid crop of kangaroo and other grasses, melons, and small white convolvulus, yielding a round black seed the size of a pea, which we found scattered over nearly the whole surface of the plain for miles together. In the lower parts of the flat rain-water appeared to have remained in shallow clay-pans until very recently, killing much of the grass, which was replaced by *atriplex* bushes. As we approached the foot of the range, the ground became stony and covered with *triodia* ; good grass was still, however, to be found in the ravines leading out of the hills, and as our object was now to shape a course to the southward, we followed up one of the most promising valleys, in the hope that it might lead us through the range ; but we were disappointed in finding that, after pushing some distance up very steep and rocky passes, they all terminated in cliffs of horizontal sandstone,

running in parallel bands, one above another, to the height of 500 or 600 feet, and frequently extending, without a break, for 10 or 15 miles along the face of the range. The horses being much fatigued by the climb from the valley of the river, we encamped at 3 h. 10 m. within the hills, and without water. (*Camp 12.*)

6th.—A light drizzling rain came on early in the morning, but not enough to supply the horses, which rambled so far during the night in search of it, that it was noon before they were all collected. Quitting the range, which had been named, after one of the most liberal promoters of the Expedition, Hamersley Range, we took a north-east course, crossing over 12 or 14 miles of beautiful open grassy plain, in many parts the kangaroo grass reaching above the horses' backs; the soil being of the richest clay-loam, occasionally containing beds of singular fragments of opaline rocks, resembling ancient lava. By 5 h. 30 m. p.m. we reached the river again, several miles above the deep glen that had checked our course on the 5th. The valley having again opened out, gave us easy access to its banks, which were here a rich black peat soil, containing numerous springs. Here was first observed a very handsome fan-palm, growing in topes, some of them attaining to the height of 40 feet and 20 inches diameter, the leaves measuring 8 to 10 feet in length. The river had again opened into deep reaches of water, and contained abundance of fish resembling cobbles, weighing 4 and 5 lbs. each. The whole character of the country was evidently changing for the better, and as I have no doubt that at no distant period it will become a rich and thriving settlement, I named the river the Fortescue, after the Under Secretary of State for the Colonies, under whose auspices the Expedition took its origin, and the large expanse of fertile plain that lies between the river and the Hamersley Range, Chichester Downs.

7th.—A quarter of a mile up the river brought us to a fine tributary from the south, running strong enough to supply a large mill. This had to be traced up for 2 miles before we could find a ford; it was found to take its rise in several deep pools, fed by springs issuing out of the plains crossed yesterday. Some powerful springs were also observed to flow into the river from the northward, through a dense forest of melaleuca, with a rank undergrowth of canes, flags, &c. At 5 miles the river again presented a wide reach of water several miles in length, after which it all at once broke up into numerous channels, wandering through a forest of white gum, well grassed, the soil being highly fertile. Owing to my having been accidentally trodden upon by one of the horses, we were obliged to encamp early, having only made about 12 miles. (*Camp 14.* Lat. $21^{\circ} 40' 42''$; long., by account, $117^{\circ} 17' E.$)

8th.—Following up the channel upon which we had encamped,

in about an hour it was lost in open grassy plains, which we continued to traverse until noon, when we struck on a well-defined stream-bed, which had branched off a mile or two short of last night's camp. Grass and water being abundant, we halted till 2, when we resumed an easterly route to 5 h. 30 m., over rather stony plains, yielding triodia. Encamped after dark without water or feed, tying the horses up short to prevent their rambling; having accomplished about 20 miles in an E.S.E. direction during the day. (*Camp 15. Lat. 21° 49' 40".*)

9th (*Sunday*).—Less than a mile this morning brought us to a grassy channel containing water, which was followed up for a short distance, when we halted for the remainder of the day to refresh our tired and famished horses. (*Camp 16.*)

10th.—The channel of the river was still followed for several miles to the eastward, when it again disappeared in open plains extending to the base of the Hamersley Range, which still continued to run parallel to the river, at about 7 miles' distance to the southward. Pools of water were occasionally found in channels scooped out of the alluvial soil of which the plains were composed, the waters of the Fortescue, during the period of the summer rains, spreading over the country for miles, and leaving a rich deposit of alluvial mud, adding greatly to its fertility. In the course of the afternoon we came suddenly upon a party of natives, digging roots. One woman, with a child about five years of age, hid close to our line of march, and did not move until she was afraid of being run over by the pack-horses, when she ran away, leaving the child gazing upon the monster intruders with a look of passive wonder. It was a poor, ill-conditioned-looking object, suffering from a cutaneous disorder. On giving it a piece of damper, it quickly began to devour it, tearing it to fragments with its sharp and attenuated fingers, with all the keenness of a hawk. We left it standing with a lump of bread in each hand, where its mother would no doubt find it when she came to see what had been left of it by the *large dogs*, as the aborigines of this part of Australia call our horses. Travelling on till late, we encamped in an open grassy plain, without water. (*Camp 17. Lat. 21° 55' 57", long. 118° 3'.*)

11th.—Four miles to the south-east we came upon a pool of brackish water, surrounded with bulrushes, in a channel coming from the south of the Hamersley Range, again apparently offering us a chance of getting to the southward. We accordingly struck for the gorge out of which this stream came, and succeeded in penetrating for three miles up a very rocky gully, filled with some of the harshest triodia we had yet encountered, and had to halt for the night in a narrow pass, where there was scarcely room to tie up our horses. (*Camp 18. Lat. 22° 12' 52".*)

12th.—One of the horses having slipped his halter during the night, Messrs. Brown and Brockman returned down the gully to track it up, while we made an attempt to follow up the deep defile in which we were hemmed, but a quarter of a mile brought us to an impassable barrier of cliffs. Retracing our steps about a mile, we again made an attempt more to the eastward, and this time succeeded in reaching a considerable stream-bed, which ultimately proved to be the main channel of the Fortescue, and led us through the range. Resting till noon, Messrs. Brown and Brockman overtook us with the missing horse, when we resumed our route up the bed of the river to the southward, until again brought to a dead stand by the whole bed of the stream being occupied by deep pools of water, fed by numerous strong springs. As it was getting late in the day, I left the party to form a camp, while I climbed the hills to get a view of the country in advance. A laborious ascent of nearly an hour brought me to one of the highest summits of the range, at an elevation of about 2,700 feet above the sea, and 700 above the bed of the river. From this hill I had a fine view to the southward, and observed that by following up a small dry ravine to the south-east, there would be a fair prospect of reaching a large extent of open level plain, that came within 2 or 3 miles of the camp, in that direction. To the east and south-east the range was lofty and mountainous, while to the south and south-west stretched open grassy plains, occasionally interrupted by bold detached hills, apparently of the same formation as the Hamersley Range. On descending to the camp, I started a fragment of rock of a few tons' weight, which rushed with fearful velocity towards the deep gorge in which the horses were feeding. After carrying all before it for a quarter of a mile, it made a clear spring over a cliff 200 feet in depth, and plunged into the waters below with a sound like thunder, inducing a belief at the camp that a large portion of cliff had fallen. Fortunately it did not produce an *estampede*, which I had known to have been caused on another occasion by a similar occurrence. (*Camp 19.* Lat. $22^{\circ} 15'$, long. $118^{\circ} 4' 30''$.)

13th.—Availing ourselves of the observations made yesterday, we succeeded, after a hard scramble of two hours, in getting through the remaining portion of the range, our horses having learned to climb like goats, or they never would have accomplished the passage. The plain appears to have a considerable elevation above those to the northward, and is drained by several deep breaks through the Hamersley Range. Resuming a s.s.w. course to lat. $22^{\circ} 26' 32''$, we passed at first over some very stony land, yielding little else besides triodia and stunted acacia, but for the last 6 or 7 miles was a rich alluvial clay, covered with very fair pasture, and water was found in abundance in pools in the bed

of a watercourse coming from the south-east. (*Camp 20.* Lat. $22^{\circ} 26' 58''$.)

14th.—On our first landing at Nickol Bay, the nights had been very mild, but we now began to feel them cold and bracing. This was partly owing to the increased elevation of the country we were now travelling over; the south-east wind, coming off the mountainous country, was very keen, and almost frosty early in the morning. Our course this day was at first over tolerably good country, which gradually became more and more rocky, the ridges increasing in elevation, until the aneroid barometer fell to 27·33, giving an altitude of 2,400 feet above the sea. Night overtook us in a deep rocky ravine, where we had much difficulty in keeping the pack-horses together, and were at last compelled to unload them amongst rocks in the bed of a dry watercourse trending to the westward; a little grass being procurable in the vicinity. Fortunately water had been met with at noon; so that we were not pressed for want of it. (*Camp 21.* Lat. $22^{\circ} 41' 43''$.)

15th.—Following the gully upon which we had encamped, it led us to the westward, over a very rocky line of country, until 1 P.M., when, not meeting with any water, and the horses showing great weakness and symptoms of distress from the loss of their shoes, it was found desirable to quit the main gully and try and find feed and water up a promising tributary coming from the north, with the view of ultimately falling back on the plains under the Hamersley Range, should we fail to meet with water sooner; fortunately, however, in an hour we came upon a small supply amongst rocks, surrounded by some tolerable feed. Had we failed to find this timely relief, it is probable that not more than half the horses would have been able to carry their loads back to the nearest known water-hole. (*Camp 22.*)

16th (*Sunday*).—This day of rest was alike acceptable to man and horse, and afforded me an opportunity, after reading prayers to the party, to clear a set of lunar distances, by which I found that the chronometer would have placed us 40 miles to the west of our true position. I had long since observed that it could not be trusted under even ordinary variations of temperature, but could procure no other, the Acting Surveyor-General having declined to supply me with either of the two chronometers belonging to his department that could be relied on, and in consequence I now found I should be compelled to have recourse entirely to lunar observations and triangulation for the compilation of the maps, which would add very much to the amount of labour and liability to error. Several crested pigeons, white cockatoos, and crested quail or partridges, were shot as they came to drink at the water-hole.

17th.—The horses had so far recovered after the day's rest,

that we were enabled to resume a south-west course, following down the bed of the stream to lat. $22^{\circ} 51'$, the country slightly improving towards evening; but we again had to encamp without water, having however obtained a small quantity in some gravel at noon. The hills to the east of our track rose about 1000 feet above the bed of the watercourse, and consisted of metamorphic sandstones and shales, intersected by whinstone dykes, their summits being capped with red conglomerate. In one place the river had cut through a ridge of altered rocks, and exhibited a very singular contortion of the strata, the laminæ being crippled up into an arch of 100 feet high, showing a dip on each flank of 45° , forming a cave beneath, running for some distance into the hill. (*Camp 23.*)

18th.—Continuing to follow the stream-bed south-west for 8 or 9 miles, we came upon a patch of very green grass, on which we halted, to allow the horses the benefit, on account of their not having had any water since noon yesterday. In the meanwhile, accompanied by Mr. Brown, I started off and walked to a prominent hill 6 miles to the south, to get a view of the surrounding country. From the summit of this hill, which we found to have an elevation of 700 or 800 feet, we procured a valuable round of bearings, and had a distant view of the country to the southward. Level plains and detached ranges of moderate elevation appeared to be the general character of the country towards the Lyons River. We returned to the party by 3 p.m., and were glad to find that during our absence water had been found in shallow clay-pans a mile to the westward, to which we moved over and encamped. (*Camp 24.* Lat. $22^{\circ} 56' 23''$, long. by account $117^{\circ} 21'$.)

19th.—We were unable to proceed this day, owing to my having eaten some of the dwarf mesembryanthemum, which I had formerly observed to be used as food by the natives on the Gascoyne, but which had produced with me violent headache and vomiting. The horses were, however, enjoying excellent feed; and I contrived to work up my map and clear a lunar.

20th.—Started at 7 h. 25 m., with 19 horses, having been obliged to leave behind a horse belonging to Mr. Lennard, so lame that he could not move. Following the stream-bed nearly west for 10 miles, came upon a pool of permanent water, containing flags—the first we had met with since quitting the Hamersley Range. This was of great value, as there was no water that could be depended upon on our return, in the last 60 miles. Pushing on quickly for 12 miles farther, the river entered a wide plain, in which was some tolerable feed; we had again, however, to halt for the night without water.

21st.—Although the size of the channel of the river we had

been following down for the last 60 miles had considerably increased both in width and depth, yet very little water had been found in it, and as it took a decided turn in its course this morning to north-west, after two hours' ride, without observing any change, and there being every appearance of its keeping the same course for the next 20 miles, I was convinced that it could not be a tributary to either the Edmund or Lyons, which I had at first hoped it might prove. The barometer also ranged too high for it to be at a sufficient elevation to admit of it flowing into either of those rivers, as the elevation of the Lyons at the confluence of the Alma is at least of the same altitude above the sea. Having named the river the Hardey, we fell back upon the pools passed yesterday, where I had decided upon forming a *depôt* camp, at which to rest the weakest horses, while with a lightly-equipped party I proposed to complete the exploration of the country intervening between this and the Lyons River. (*Camp* 26. Lat. $22^{\circ} 58' 28''$, long. $117^{\circ} 10'$.)

22nd.—In accordance with the plan decided upon yesterday, I started this day, accompanied by Messrs. Brown, Harding, and Brockman, with 3 pack-horses, conveying 8 days' provisions and 14 gallons of water. Twelve miles on a s.s.w. course over a very stony country brought us to a deep stream-bed trending in the same direction, which we pursued for 13 miles, the country gradually improving, until the channel was lost in an open plain of rich soil, covered with fine green grass. Several pools of rain-water of a deep red colour, but fresh and sweet, gave us a good camp for the night; a set of stellar observations giving the lat. $23^{\circ} 19' 16''$. To the south, at about 6 miles' distance, lay a bold range of hills, running nearly east and west, with many sharp summits, having an average elevation of from 600 to 1000 feet above the plain, and extending for 12 or 15 miles to the eastward, while to the west it was lost in numerous broken hills of lesser elevation. (*Camp* 27.)

23rd.—As to pass the eastern end of the range appeared likely to take us too much off our course, we struck for what appeared to be a break in the hills about 7 miles to the south-west. The first 5 miles was across an open grassy plain, at times subject to inundation, which brought us to the bank of a fine river, containing permanent reaches of fresh water, lined with canes, the channel generally being from 100 to 200 yards wide, with a depth of 40 feet; it was now barely running, but it was quite evident that it was too large for either the Alma or Edmund, and its bed must be at least 200 feet below the level of those rivers. We, however, determined to follow it so long as it ran to the south of west, which it did until it came in contact with the range observed yesterday, when it altered its course to w.n.w., and appeared to continue that

direction for many miles, probably until joined by the Hardey, when, in all likelihood, it continues its course direct to Exmouth Gulf. Anxious as I naturally was to continue the examination of this promising river, time and the condition of our horses' feet did not permit us to do so with advantage. Naming it the Ashburton, after the noble President of the Royal Geographical Society, we quitted its verdant banks, and took a south course up a stony ravine, which led us into the heart of the range, where we soon became involved amongst steep rocky ridges of sharp slaty schist, which very quickly deprived the horses of many of their remaining shoes, and retarded our progress so much that by night-fall we found ourselves to be in only lat. $23^{\circ} 28' 15''$ —hemmed in on all sides by rugged country, yielding little else but small acacia-trees and triodia. A little water and grass was, however, obtained in the bed of a stream tributary to the Ashburton. The summits of the hills passed over during the day had been seen from the Lyons River in 1858, and were now named the "Capricorn Range." (*Camp 28.*)

24th.—A rather rough ridge of four hours to the south-east brought us to a watercourse 60 yards wide, trending to the N.N.E., in which we found pools of water, lined with reeds and flags. This was traced up to the southward till 3 P.M., when we entered a deep gorge in a sandstone range, the bed of the stream becoming very stony and full of melaleuca-trees; it, however, contained many fine pools and strong running springs, with a small supply of grass. There was now a fair prospect of our reaching the Lyons, as the range we were entering must contain the sources of the Edmund, which river has a much more restricted course than was originally supposed. (*Camp 29. Lat. $23^{\circ} 42' 15''$.*)

25th.—The country continued hilly for about 10 miles, when we arrived at the summit of a granite and sandstone table-land, at the extreme sources of the watercourse we had been following up. From this point we had at last the satisfaction of observing the bold outlines of Mount Augustus, bearing S.S.E. about 30 miles, while more to the westward could be discerned the summits of Mounts Phillips and Samuel, and yet more to the right the southern face of the Barlee Range. Descending to the south across an open plain, we struck for a remarkable gorge in a granite range (the only one now between us and the Lyons), at which we arrived by sundown. On examining this singular gorge, it was found to be an almost perpendicular cut through a narrow ridge nearly 200 feet in depth, the length of the pass not exceeding 200 yards, the plain on each side being nearly on the same level. From the summit of this pass the course of the stream could be traced across the fertile flats of the Lyons until it was lost in the numerous channels of that river, and I was able to obtain bearings

to many well remembered objects noticed on my former visit to this part of the country. (*Camp* 30. Lat. $23^{\circ} 56' 45''$.)

26th.—As we had only four days' rations left, and no object could be attained by advancing farther south, unless there had been time to examine the present condition of the pasture in the vicinity of Mount Augustus, we marked several trees on the north side of the gorge close to a pool, and retraced our steps to within a mile of our camp of the 24th, having improved upon our outward track by keeping rather more to the eastward. (*Camp* 31.)

27th.—Instead of returning by the rough route by which we came through the Capricorn Range, we followed the stream to the N.N.E., through a good country all the way to the Ashburton, which river it joined in lat. $22^{\circ} 26'$, passing through the end of the range 1 mile south of the junction. In this pass we encamped on a fine deep pool, in which we caught a small quantity of fish, showing the water to be permanent. (*Camp* 32.)

28th.—Making an early start, we soon crossed the Ashburton, and rode for 12 miles across open plains, thinly timbered and yielding a large quantity of good pasture, principally of kangaroo grass, which here grew to the height of 6 feet. Resting for several hours at the water-holes of the 22nd, at 4 h. 30 m. P.M. we resumed our route, having filled our water-kegs, and pushed on to within 16 or 17 miles of the dépôt, encamping amongst some good grass on our outward route, but without any water except what we carried with us. (*Camp* 33.)

29th.—Giving our horses rather more than a gallon of water each, we made an early start just as it came on to rain, which was the first shower we had experienced since the 27th May; it continued until noon, but not heavy enough to leave any surface water on the parched and thirsty loam. Keeping more to the westward than our outward track, we escaped much of the stony ground then passed over, and arrived at the dépôt camp by 2 P.M.

30th (*Sunday*).—Remained in camp and read prayers to the party.

July 1st.—The horses left at the dépôt were much improved by their 9 days' rest, and had we been provided with more shoes for them, I should have at once returned to the Ashburton, and traced that river up to the eastward, as it offered a fine opportunity of penetrating to the south-east, probably at least another 100 miles; and our provisions on a reduced allowance would admit of our remaining out 40 days longer; but the lameness of many of the horses, and the lacerated condition of their fetlocks, convinced me that should we meet with any more difficulties or rough country before obtaining a fresh supply of shoes, much valuable time would be lost, and we should probably fail to get many of the horses back. I therefore deemed it more prudent to return at once by a

shorter route more to the eastward, so soon as we had repassed the Hamersley Range, and, obtaining a refit at the bay, to throw all our remaining time into the second trip. We accordingly to-day returned to Camp 24, where we found the horse left there on the 20th June, sufficiently recovered to accompany the party, although incapable of carrying a load. The remainder of the day was devoted to obtaining bearings, and adding to the triangulation of the many remarkable summits visible from this part of the country.

2nd.—The country generally being very rough, except on the banks of the Hardey, on our outward track, we found it desirable to return along it, more particularly as there was a better prospect of procuring water by so doing. At about 20 miles we found a little water under a cliff in the bed of the stream, and halted for the night. (*Camp 34.*)

3rd.—Still returning on our old track, at 5 miles I stopped to ascend a very remarkable hill which had formed an important point in the triangulation of this part of the country, to which had been given the name of Mount Samson. Sending the party onward to wait for me at Camp 22, I commenced the ascent of the mount, which proved something more than I had calculated upon, as it occupied more than an hour's sharp toil to arrive at its summit; when gained, however, it amply repaid the trouble, as from it I could discern almost every prominent hill or peak within 60 or 70 miles, and amongst them the mountain which, on a former occasion, I had procured a bearing to from Mount Augustus, at a distance of 124 geographical miles, and which I now named Mount Bruce, after the gallant commandant of the troops, who has always warmly supported me in carrying out explorations. This part of the country I believe to be the most elevated in North-West Australia: Mount Samson having an altitude of not less than 1000 feet above the valley of the Hardey, while Mount Bruce and the mountainous country to the eastward rose to a considerable height above its summit, which, by comparisons from the aneroid barometer, would give not less than 4000 feet for the elevation of those ranges. Having completed my observations, I descended the hill with somewhat greater speed than it took to climb it, and was met at the foot by Messrs. Brown and Harding, who had waited for me with a horse. In less than an hour we overtook the rest of the party at Camp 22, when the additional horses at once drank up all the remaining water left in the rocks; resting, therefore, less than an hour, we moved on, taking a north course, over a very rocky but highly fertile country of trap formation, the grass just now being much dried up. At sundown we halted in an open grassy flat, on which no water could be found, although it is probable there is plenty in the vicinity, as emu and cockatoos were

numerous; one of the former walked boldly up to the horses, and was fired at, but without effect. (*Camp 35*, lat. $22^{\circ} 32' 13''$.)

4th.—Travelling at a rapid pace on an average north-east course for upwards of 20 miles, over plains mostly of rich loams, well grassed, and extending to the southern foot of the Hamersley Range, we came upon a low range of sandstone hills, covered with acacia bushes and triodia, extending for 3 or 4 miles, when we again emerged on open plains, in which was found a deep channel, 30 yards wide, containing pools of rain-water retained in the clay. The amount of fine pasture-country passed over during the day could not be less than 200,000 acres; and although we had not time to go in search for it, I have no doubt that abundance of water will be found in the deep gorges of the range skirting the plain. This tract of country is, I imagine, well suited for the growth of either cotton or sugar, as it is apparently well irrigated during the summer months, and the soil is remarkably rich and strong, while its limits to the westward are at present unknown, and it most probably continues to skirt the hills for at least 30 or 40 miles. Halted at the water-holes about 4 miles to the west of the pass through the Hamersley Range. (*Camp 36*.)

5th.—Two hours brought us to the head of the pass, which we entered by a ravine a little more to the northward than on our outward route, and by so doing saved a preliminary ascent of nearly 200 feet, and a similar amount of descent, making a very successful passage through the range, without experiencing the same difficulties we had formerly met with, and by 3 P.M. found ourselves once more in the open grassy country that forms the Chichester Downs. At 6 P.M. encamped in an open flat without water. (*Camp 37*.)

6th.—Started at 7 h. 30 m., and in an hour came upon a pool of water in one of the numerous channels into which the Fortescue is here divided, and at 7 miles struck the bulrush spring passed on the 11th June. From this the river was followed down for 13 miles through grassy clay plains, thinly timbered with white-gum. Encamped on a pool, in lat. $21^{\circ} 53' 4''$, about 5 miles north of a very remarkable bold projection of the Hamersley Range. (*Camp 38*.)

7th.—Sunday was kept as a day of rest.

8th.—The horses strayed so far back on our tracks during Sunday night, that by the time they were brought in it was too late to make a start with advantage, as we were now about to enter a new tract of country, by striking for the coast somewhere between Breaker Inlet and Depuch Island. As a knowledge of this part of the country would greatly assist us in starting on the second division of our exploration, I availed myself of the delay

here to fix by triangulation many of the summits and prominent spurs of the Hamersley Range, and take observations for the variation of the needle, which I found to be about 1° E. by the prismatic compass I had in use.

9th.—Our horses again gave us some trouble to find them, so that we did not start until 10 h. 30 m. Two hours' sharp travelling across the plain brought us to the foot of low hills of trap and sandstone, covered with triodia; good feed being, however, plentiful in the valleys, although now rather dry. Tracing up a small tributary to the Fortescue, at sunset we halted on a small rocky pool, near its source, in lat. $21^{\circ} 41' 40''$. Several pools, supplied by springs coming from under the superstratum of sandstone, were passed during the day. (Camp 39, long. $117^{\circ} 47'$.)

10th.—For 7 miles the country continued gently to ascend, the sandstone giving place to trap boulders, yielding a very rich soil, clothed with short green grass and melons, the soil being too stony for agricultural purposes, although I have seen country of a similar appearance in the island of Mauritius producing fine crops of sugar. Some of the melons weighed as much as 5 or 6 ounces, and were passably good eating, although rather bitter. At noon the country dropped suddenly to the northward, and we descended a deep rocky ravine in which we soon found water and grass. Travelling now became difficult and sometimes dangerous to the horses; rugged and semi-columnar metamorphic sandstone cliffs hemmed in the ravines on either side, while large rounded boulders of trap rock filled the bed of the stream, which in several places was running. We had a rather indifferent camp in lat. $21^{\circ} 29' 10''$, the camp at Nickol Bay bearing w.n.w., distant 75 miles by account. (Camp 40.)

11th.—The stream we were upon continued to take a northerly course for 8 or 10 miles down a valley from 200 to 300 feet in depth, where it is diverted to the eastward for about the same distance by a cross range of black volcanic hills of loose ragged rocks, totally devoid of vegetation. The channel, receiving several tributaries, here becomes a succession of fine open pools of water from 80 to 150 yards in width. We halted for the night on a wide bed of bare sand and rocks, the only feed being in the channel of the river, to which was now given the name of Sherlock. (Camp 41.)

12th.—This morning the river resumed a n.n.w. course, and very soon led us out into an open plain, rather sandy in character; the channel dividing into several branches, separating, miles apart, the stream of water issuing from the hills, soon being absorbed in the sandy bed; but a well-defined line of verdant trees served well to mark the course of the channels through the plain for many miles. Selecting the one that appeared the most promising, it was

traced down to lat. $21^{\circ} 6' 43''$, where we encamped on a shallow pool of brackish water, the only one seen during the day. Several natives were found here, employed capturing partridges, by means of nets constructed out of the leaf of the triodia, neatly twisted and netted in the same way as done by ourselves; the mesh varying from 1 to 5 inches according to the purpose to which it is applied. It was very singular to observe the mode in which they induce the birds to enter the nets or rather cages prepared for them. In the first instance they place ragged bushes all round the small pools, with the exception of a few spaces 5 or 6 feet wide, from which openings they stick in a double row of twigs, arching so as to meet overhead in the centre 1 or 2 feet from the ground; these little avenues lead away for several yards, and then terminate with a net thrown over a few light sticks at the end. The birds first alight on the margin of the pool, but after drinking do not take flight at once, but run up the only opening, which leads them first under the arch of twigs and finally into the net, which is then drawn to by the hunter lying in wait under a few bushes. In this way they must capture a large amount of game, judging by the quantity of feathers around some of the water-holes. (*Camp 42.*)

13th.—Two miles north the river turned west, and kept that course for 7 or 8 miles, through a poor sandy and stony tract of country, and was then joined by a fine channel coming from the south. Near the junction, are two reaches of water, half a mile long each and a rifle-shot across, containing a quantity of ducks and other water-fowl, amongst which our sportsmen were very successful, along with other game, bagging the only two swans we had seen since landing; a number of fine fish like cobblers were also caught, weighing from 1 to 5 lbs. a-piece. As it was Saturday, and our horses were showing unmistakeable signs of knocking up, we halted for the rest of the day. (*Camp 43.* Lat. $21^{\circ} 6' 5''$; long. $117^{\circ} 32' 30''$.)

14th (*Sunday*).—After reading prayers, Messrs. Brown, Harding, and myself walked to the summit of the range of black volcanic hills that skirted the western bank of the river, at about a mile distant. These hills consist of ragged scoria, elevated 300 to 400 feet above the plain, and are nearly destitute of vegetation. At their summits are deep fissures, the heat of the eruptive rocks from beneath having been sufficient to convert the trap and sandstone rocks into a deep bluish grey scoria, having a specific gravity of nearly 4, but we did not observe any instance of the actual overflow of lava, and consequently there was a want of the fertilizing properties in the soil resulting from it that usually accompanies volcanic formations. A native dog had left a litter of pups under a heap of stones not 18 inches beneath our feet, but such was the sharpness and ponderability of the fragments of rock, that it fairly

baffled our attempts to unhouse them. A valuable round of bearings was procured from this spot, Depuch Island being seen, bearing N. 14° E., distant about 28 miles.

15th.—We resumed our course down the Sherlock, the stony nature of the country telling severely upon our horses' feet, which in other respects were in very tolerable condition. We had not proceeded more than 3 or 4 miles, when Mr. Brockman's horse, Rocket, gave in and could not move another step, the hoof being fairly worn through; leaving him close to a pool of water amongst plenty of feed, I hoped he might possibly recover by the time we returned from the bay. Below this the channel became sandy and dry, and we only procured a little water at night in a clay-hole. Plains extended from the river to the north and eastward as far as the eye could reach, only interrupted by occasional detached hills of granite or volcanic trap, the feed being generally coarse and the soil poor. (*Camp 44.* Lat. $20^{\circ} 54' 45''$.)

16th.—Leaving the valley of the river on a north-west course, in half an hour we came upon an open plain of rich clayey loam, covered with a fine even sward of good grass, on which were feeding large flocks of pigeons and white cockatoos; this change in the character of the soil being ascribable to the occasional overflow of the river, leaving a deposit of rich mud. This plain extends as far as we could see to the north and east, a few widely-scattered topes of trees being the only objects breaking the monotony of the sea of grass. To the north-west was a strong line of large timber, for which we steered. At 3 miles we entered the wood, and found it to contain the main channel of the Sherlock, in which were a few small pools of rain-water. Crossing the bed of the river on the same course, we soon came upon another branch coming from the south-west, which was named the George. Immediately below the junction of the two streams, the river opened out into reaches of brackish water, evidently under the influence of the spring tides. From this point the left bank was followed down to within 3 or 4 miles of the sea, where the country becoming low and flat, the grass coarse, and no fresh water procurable, we quitted the Sherlock and struck to the west for 6 or 7 miles, crossing several salt-water creeks, until we were compelled to turn to the southward, to avoid a channel much larger and deeper than the rest, at which a party of natives were engaged drawing their nets, but ran away on our approach. A little farther on the plain became more fertile, and we found a small pool of rain-water in the clay, at which we encamped. There is no doubt that the Sherlock and the creek we were upon discharged their waters by the numerous creeks shown on Captain King's charts, 15 or 16 miles to the west of Depuch Island. (*Camp 45.* Lat. $20^{\circ} 52' 15''$; long. $117^{\circ} 15'$.)

17th.—By observation of the sun at rising, the variation of the needle was found to be $1^{\circ} 10'$ E. We were now about 40 miles from Nickol Bay, and as it was very doubtful whether water would be procurable in that distance, I became very anxious on account of the horses, as, should the country prove stony, I was quite certain they could not perform the journey in less than three days; I therefore determined upon following up a leading valley towards the Maitland River, with the intention, in the event of not finding water or a pass through the heavy mass of hills that back Cape Lambert, of pushing through the upper branches of that river, and by a round of 60 or 70 miles to approach the bay by our outward track; fortunately, however, in the course of the day we fell in with some small pools of rain-water, which enabled us to advance about 18 miles over tolerably even plains, well grassed, our night-halt being without water. (*Camp 46.*)

18th.—From our position, and the observations I had made of the country on the eastern shores of Nickol Bay, I was satisfied that the breadth of stony ranges lying between us and our destination did not exceed 8 or 10 miles, which we therefore now determined to venture upon, although at great risk to the horses, some of which now walked upon stones as they would over red-hot coals. Entering the range by a small ravine, 3 hours' scramble over sharp rocks brought us out on the head of a small tributary to the Nickol River, the sufferings of the horses in crossing the range being quite painful to witness; they all, however, succeeded in getting through, and as a little water was found in the bed of the stream, we were enabled to push on late, and cross the marsh at the head of the bay before it was quite dark, the departing rays of the setting sun having first favoured us with a glimpse of the *Dolphin* riding at anchor on the deep blue waters of the bay—a sight which was welcomed with no small satisfaction by the little band of weary travellers. (*Camp 47.*)

19th.—The camp was easily aroused by the morning watch, as there was now only 6 miles between us and the landing-place in Hearson Cove, the horses appearing to partake of the general activity; so that it was only 10 A.M. when we arrived on our old camping-ground, which we found occupied by ten or a dozen natives, engaged mending their nets. Coming upon them suddenly, they would not stop to carry off their gear, although not half an hour before they had been employed assisting a boat's crew from the *Dolphin*, in loading with wood and water. A rifle-shot soon recalled the boat, which was not a mile from the shore, when we were glad to learn that Mr. Hearson was fast recovering from his wound, and that all had been going on well since our departure. From Mr. Walcott I ascertained that he had been able to establish a friendly understanding with the natives who frequented the

western side of the bay, and that they had been made useful in filling up the ship's water and wood, for which service they had been rewarded by a suitable distribution of biscuit. In one instance the natives on the eastern shore of the bay had shown a hostile tendency, on the occasion of a boat landing on the reef to gather shells. One of the seamen, who had wandered from the rest, was chased into the sea, and menaced with spears and clubs, until he was up to his neck in water, when the boat came to his rescue, the officer in charge of her firing a shot over their heads to drive them off. Mr. Walcott had also been successful in obtaining a very useful vocabulary of native words and other interesting particulars from the aborigines, as also many botanical specimens, shells, &c.,—amongst the latter, some very fine pearl oysters, from which several pearls of good colour had been obtained, but appeared to be principally valuable on account of the size and beauty of the mother-of-pearl, which averaged 6 inches diameter, with more than half an inch in thickness of solid shell.

20th.—The forge, stores, and other additional supplies having been landed, and the party set to work shoeing horses, repairing saddle-bags, &c., I proceeded with Mr. Walcott and Mr. Angel in the boat to make a rough survey of the coves on the western side of the bay, with a view to selecting a suitable spot from which to re-embark the horses on our return from the next trip, as it would be too late in the season, by that time, to venture the trip overland to Champion Bay. I found that a good anchorage existed, with 3 fathoms at low water, 1 mile off the little cove from which the ship had been watered, and is approachable at all times, except in strong east or south-east gales, when a heavy swell sets in across the bay, rendering a landing unsafe. The fresh water runs down a rocky gully at the north-west corner of the cove, at the north end of a small patch of sandy beach, and the supply appears tolerably abundant; it is, however, rather difficult of access towards the end of the dry season, as the water has then to be carried over the rocks in small baracas 50 or 60 yards to the boats; but from the setting in of the rains to the end of August, it runs down strongly at high-water mark. I walked back overland to the camp with Mr. Walcott, the distance being about 4 miles; heading by the way another deep cove, the margin of which was lined with a broad belt of mangroves.

21st to 28th was fully taken up in shoeing horses, making spare shoes, refitting and packing stores, &c., ready for our trip to the eastward, my own time being principally taken up in roughly plotting the country already explored, so as to secure all the information obtained, in the event of any accident occurring to my field-books.

29th.—Everything being in readiness for our departure, I gave

Captain Dixon instructions to wait for us in the bay to the 10th December, and in the event of our not then returning, Mr. Walcott would land one of the ship's iron tanks, and bury in it a quantity of stores, at a spot already agreed upon; the *Dolphin* would then proceed to Fremantle. It blew so fresh all the morning, that I could not land until 3 P.M., when we quickly saddled up and proceeded 3 miles to a water-hole up in the volcanic hills, as it was probable we should have a very long day's march to-morrow without water. As we had now only 19 horses, and one of these so low in condition as not to be able to carry a load, we could only take with us 87 days' rations, at the rate of 1 lb. of flour, 7 oz. of meat, and 4 oz. of sugar per man per diem; we were, however, well provided with ammunition, and 30 spare sets of horse-shoes, with nails sufficient for at least two removes, the horses themselves being shod at starting with extra strong shoes, tipped with steel. We had now only seven saddle-horses; so that one of the party was always on foot by turns of an hour each. It had been originally intended that the *Dolphin* should proceed to Roebuck Bay and meet us there; but it was now so late in the season, that I did not deem it prudent to run the risk of removing her to an unknown anchorage, where it was possible we might not be able to reach, and thus lay ourselves open to the probability of a very embarrassing uncertainty. The result proved we had adopted the right course. (*Bivouac*.)

30th.—This morning we crossed the marsh with some difficulty, as all the pack-horses but three fell and stuck in the mud, until we transferred their loads to our own backs and carried them through half a mile of the softest part. This operation detained us so long, that we did not make more than 18 miles, when we found a little water left in the pool seen on the 18th. (*Camp 48*.)

31st.—Started at 8 A.M., following our own tracks to 3 h. 30 m. P.M., when we turned to the south up a stream-bed crossed on the 17th. At the gorge where it issued from the granite ranges, we found a fine pool of permanent water and abundance of beautiful green grass. This stream was now named the Harding, and as the packs were heavy, we remained here the rest of the afternoon. (*Camp 49*.)

August 1.—Passing under the northern foot of the granite ranges on an easterly course for 16 miles, we came upon a fine reach of open water in a branch of the creek on which we had encamped on the 16th July. This pool was a valuable discovery, as it would not only form a useful halting-place on our return, but, from being in the middle of a fertile plain, containing at least from 15,000 to 20,000 acres of arable land, equal in quality to the Greenbough Flats, the whole could, if necessary, be easily irrigated from this large natural reservoir, the highest part of the plain not being 30

feet above the water-level at the driest period of the year. This fine tract of country, in connection with the lands already seen almost adjoining on the eastern bank of the Sherlock, would in itself support a larger population than is at present contained in the whole of the colony of Western Australia. We had seen more kangaroo on these plains than on any other portion of our route; one that was shot resembled the *osphranter*, and was in very good order, the fur much thicker and softer than the common kangaroo of the western coast, and of a pale mouse colour. It weighed about 45 lbs. (Camp 50. Lat. $21^{\circ} 54' 18''$.)

2nd.—Proceeding eastward over grassy plains and stony ridges, at 13 miles we struck the Sherlock, only 2 miles below the pool at which we had left the horse Rocket, and hoped to find him improved by the rest; but on approaching the spot, the presence of crows and a wild dog gave indications of a different fate; we found him partly devoured within a few yards of where we left him, inflammation of the feet having most probably produced mortification. Pushing on till sunset, we arrived at our old camping ground (Camp 43) at the bend of the Sherlock. (Camp 51.)

3rd.—Followed up the left bank of the Sherlock to Camp 42, and found a little water still remaining in the Bird-cage pools, where we halted for 2 hours. At 1 h. 30 m. resumed an easterly route, across a sandy plain, yielding little but hakea and triodia. Five miles brought us to a large branch of the Sherlock, coming from the south-east, in which were several small permanent pools, surrounded by flags, at which we halted. (Camp 52. Lat. $21^{\circ} 7'$.)

4th (Sunday).—Although the feed here was very indifferent, yet, as we had again entered unexplored country, I was glad to make it a day of rest before entering upon the rather unpromising tract of country that lay in the onward route.

5th.—Making a rather late start, on account of the horses having strayed very far in search of feed, we steered for a bold range, bearing E.S.E., distant about 20 miles. At 4 miles crossed a dry channel coming from the S.S.E., and continued our course over a poor tract of country covered with triodia and a few acacia, large bare red granite rocks cropping out here and there. At one of these was a small water-hole, near which a native was hunting mice. Although at first alarmed, he soon told us, in answer to our inquiries, that we should find no water to the east, but plenty to the south, which we found to be correct, as we had to halt, after a very long day's march, in a dry ravine in the ranges for which we had been making. (Camp 53. Lat. $21^{\circ} 10' 35''$.)

6th.—Having reconnoitred the country for some miles a-head over-night, without finding water, it was no use leading our horses farther into the rugged defiles, where we might get entangled for

many hours; we accordingly struck to the south-west for 4 miles, when we came on a rocky pool of permanent water in the south-east branch of the Sherlock, just at the point where it emerges from the hills. Having watered the horses and given them an hour's rest, we followed up the stream to the south-east for 7 miles, when it divided into numerous small dry ravines in the heart of an elevated range of granite, capped with metamorphic sandstone; water having only been met with within the first mile from where we struck it. (*Camp 54.*)

7th.—The horses requiring water, we fell back upon the pool passed yesterday, where I decided upon leaving the bulk of the party for a day or two, while I explored the country for a pass to the eastward. (*Camp 55.* Lat. $21^{\circ} 14' 28''$.)

8th.—Taking with me Mr. Brown and Mr. Harding mounted, and one pack-horse carrying water, we struck through the hills to the eastward, and at 6 miles came upon a stream-bed that led us to the north-east 15 or 16 miles, when, finding it contained no water, we resumed an easterly course over an open sandy and stony plain, covered with triodia, for 12 miles, and encamped in poor feed without water. (*Camp 56.* Lat. $21^{\circ} 4'$.)

9th.—A heavy dew having fallen during the night, our horses were much refreshed, and we were enabled to proceed with the scanty supply of water carried with us. In an hour we struck upon the channel of a river, with a sandy bed, 300 yards wide, in which were a few pools of water, under a bold sandstone bluff, rising abruptly 300 feet from the plain. From the summit of this hill the river was observed to trend to the N.N.W. for 8 or 10 miles, and to come through a gap in a granite range 4 miles to the S.S.E., towards which we now turned our steps, across extensive beds of soft drift-sand brought down by the river. Cajeput and acacia trees occupied a large portion of the channel, and it was not until reaching the gorge in the range that grass was met with in sufficient quantities to supply our wants. Several large pools, teeming with water-fowl, occupied the whole of the valley, which here was fully a quarter of a mile wide. The remainder of the day I devoted to sketching and triangulating the country, while the horses were enjoying the benefit of the fine feed. (*Camp 57.* Lat. $21^{\circ} 6' 26''$.)

10th.—As this river, from its magnitude, afforded a fair chance of working to the south-east, I determined to bring forward the rest of the party. Having named this river the Yule, we returned to the dépôt party by a somewhat shorter cut, making it in about 30 miles, which we accomplished by sundown.

11th (*Sunday*).—Party resting. Observed a set of lunars, which placed us in long. $118^{\circ} 3'$ east, the rate of the chronometer being still so irregular as to be almost useless.

12th.—To-day the whole party proceeded 24 miles towards the Yule, finding a small pool of water in a rocky ravine by the way, which we had missed on our former trip. Bivouacked in an open grassy plain, 6 miles short of the river.

13th.—Moved on to our camp of the 9th, and halted there for the remainder of the day. The latitude by meridian altitude of the sun I found to be $21^{\circ} 6' 22''$.

14th.—As travelling near the river was found to be very laborious, on account of the vast beds of loose drift-sand thrown up by the summer-floods, we steered to the s.s.e. for a pass in the ranges, about 20 miles distant, through which the river was supposed to come, but on reaching the hills, the river was observed to the westward; we accordingly altered our course to south-west, and struck it at about 6 miles, the character of the river being still the same, the aggregate width of the several channels amounting to nearly half a mile; water being procured in them by digging a few inches in the sand. The country passed over during the day was an open plain of light sandy loam, interspersed with bare granite rocks, cropping out at intervals of a few miles. Giant ant-hills, of from 10 to 16 feet in height, and 30 to 40 feet in circumference (a few of which had already been met with on our first trip), were here remarkably conspicuous, on account of their size and bright brick-red colour. An emu was shot during the day, while running at full speed, at the range of over 200 yards. (*Camp 58.* Lat. $21^{\circ} 23' 23''$).

15th.—One of the horses was missing this morning; so that we did not start until 10 A.M., when the river was followed up to the south-east, through country the same as yesterday; halting for the night in lat. $21^{\circ} 32' 13''$. (*Camp 59.*)

16th.—Our average course to-day was nearly east, occasionally crossing channels coming from the south-east. Towards evening we found that the main channel, which it had been our intention to have followed, had escaped our observation to the southward, and we were only on a comparatively small tributary coming from a rugged range of hills to the eastward. Our object for the present not being to push too far into the interior, this tributary was followed until it broke up into numerous small valleys, in one of which water was obtained by digging 3 feet in the sand, amongst tolerable feed; the country having much improved in the course of the day. (*Camp 60.* Lat. $21^{\circ} 34'$.)

17th.—Soon after starting this morning, we came upon a camp of natives, but we could not prevail upon any of them to stop and hold parley with us. Four hours' travelling over rather rocky ground led us well into the range, which we found to consist of granite, capped with metamorphic sandstones, and broken up by dykes of variegated jasper. In a deep ravine at the foot of a cliff

we found a small pool of beautifully clear spring water, which was very acceptable, as the sun had now acquired considerable power, and the grasses were beginning to get very dry food for our horses. During the halt at this spring, Mr. Harding and myself ascended the highest part of the range, which was found to be 500 or 600 feet above the plain. From this elevation I was enabled to select our onward route, and obtain bearings to several useful summits for triangulation; a few hills to the s.s.e. being visible at the distance of 60 or 70 miles, which no doubt form a part of the continuation of the Hamersley Range. Resuming an east course, the culminating point of the range was soon passed, when we descended to the eastward down some deep and remarkably picturesque rocky glens, in which were found several springs and pools of water, leading down to a fine grassy flat, in which were growing some large flooded gum-trees. (*Camp 61.*)

18th (*Sunday*).—Found our lat. $21^{\circ} 36' 8''$, long. $119^{\circ} 13' E$. by account.

19th.—The country being very hilly, it was found best to follow down the stream upon which we had encamped, although it trended to the north of east. In a few miles the valley opened out with fine pools of permanent water, covered with numerous flights of ducks, and at 8 miles it joined a wide valley from the south, down which flowed a river, divided into several channels, containing many fine pools from 50 to 200 yards wide, which were still running gently from one to another. The banks, although well grassed, were very rocky, rendering travelling excessively fatiguing to our heavily-loaded pack-horses, several of them being bruised and strained while jumping from rock to rock, the clefts being too deep and narrow for them to walk between, and the ranges bordering the valley were too steep to admit of our leaving the river, which we were compelled to follow down to lat. $21^{\circ} 26' 52''$. (*Camp 62.*)

20th.—The river, which had been named the Strelley, continued to hold a northerly course; we therefore availed ourselves of a smoother valley coming in from the east to resume our old course. At 9 miles we met with a stream, 100 yards wide, coming from the south-east, evidently tributary to the Strelley, and taking its rise in elevated granite ranges, with black volcanic ridges protruding through them, but not to any considerable height above the general level of the country. After a few hours' scramble over these ridges, we came upon a small stream, trending east, containing several springs, surrounded by high grass and flags, gradually leading us, by sunset, into a deep pass, walled in by cliffs and bluffs from 100 to 300 feet high; the stream, having joined several larger ones from the southward, now occupying nearly the whole width of the valley. We encamped in one of the

wildest and most romantic-looking spots to be found in this part of Australia, to which we gave the name of Glen Herring, from a fish bearing a resemblance to a herring being found in the stream. (*Camp 63. Lat. $21^{\circ} 20' 35''$.*)

21st.—With some difficulty we wended our way down the intricate windings of the glen for 6 miles in a north-east direction, when it opened out into grassy flats, turning to the northward. Leaving it at this point, a mile east brought us to the bank of a fine open river-bed 200 yards wide, down which a little water was still flowing, the country on its banks becoming much more promising, and grass plentiful. This river I named the Shaw, and some beautiful grassy plains through which it came for 20 or 30 miles to the southward, Norton Plains, after the talented Secretary of the Royal Geographical Society. In the afternoon a large tributary from the south-east was followed up for some miles, when, turning to the south, we quitted it, to follow an open valley leading east, towards a bold granite and schistose range, under which we encamped late, without finding water. (*Camp 64. Lat. $21^{\circ} 20'$.*)

22nd.—As we did not find water for some distance to the eastward under the foot of the hills, we turned to the south-east, quickly emerging from the hills upon the Norton Plains, and at 2 miles came upon the stream quitted last evening, to which the name of Emu Creek had been given. It had altered its course, and was again coming from the east, and contained several fine springs. This creek was followed up for the rest of the day, through a rather indifferent country, and, towards nightfall, led us into a deep rocky ravine, in which we encamped, a small supply of water being obtained from holes in the rocks. (*Camp 65. Lat. $21^{\circ} 28'$.*)

23rd.—As we advanced, the ravine divided into many branches coming from an elevated table-land to the southward; we therefore again resumed an easterly course for 5 or 6 miles, over rugged hills, and descended by a gully trending north-east, which led us in a few miles into open plains. Skirting the northern foot of the range until after dark, we encamped on a small watercourse, in which we obtained water by digging under some granite rocks. (*Camp 66. Lat. $21^{\circ} 23' 30''$.*)

24th.—The horses having suffered much amongst the rocks during the last few days, I determined to follow the southern edge of the plain until a stream could be met with to lead us to the south-east. A few miles brought us to a small watercourse running gently from some springs in the plain, which, contrary to our expectations, ran into the ranges to the south-east, instead of coming out of them. As here there was plenty of green grass and

water, and the horses were not looking well, we encamped early in the entrance of the gorge. (*Camp 67. Lat. $21^{\circ} 20' 13''$.*)

25th (*Sunday*).—Long., by observation, $120^{\circ} 17'$; var., $30'$ E.

26th.—The stream we were upon led us about 5 miles south-east through the hills, and then joined a river coming from the southward, 100 yards wide, which was followed down on an average course of E.N.E. to lat. $21^{\circ} 18'$; reeds and rank grass lining its banks in many parts, while in others granite boulders and banks of drift-sand offered considerable impediments to travelling. (*Camp 68.*)

27th.—The river took us on a northerly course 9 or 10 miles, receiving many large tributaries, several of them still running slightly, forming altogether a stream of some importance, which, on account of the large extent of pastoral and agricultural lands afterwards found on its banks lower down, and its many fine tributaries, I named the DeGrey, in honour of the noble Lord who took a lively interest in promoting the objects of the Expedition. As the object at present in view was to push to the south-east, we left this promising river and resumed an E.S.E. course, for 5 or 6 miles, into a hilly country, and encamped in a gully with rather scanty feed, a little water being obtained by digging. (*Camp 69.*)

28th.—We soon became involved in deep ravines, which led up into high table-land, the summit of which was no sooner obtained than we had again to descend equally precipitous gullies to the eastward, the horses sliding down amongst the loose rocks and stones with a velocity that threatened immediate destruction; they all, however, arrived safe at the bottom, although in so exhausted a state that two of them had very shortly after to be left behind, while we pushed on with the rest in search of water and feed, which was not met with until late in the day. After a short rest, I sent Messrs. Brown and Brockman back for the two beaten horses, while I moved the party on a mile farther to a fine spring in a grassy flat, where we encamped. (*Camp 70. Lat. $21^{\circ} 9' 3''$.*)

29th.—The two horses left yesterday were brought into camp early in the day, and as they were too weak to carry their loads, they were placed on our saddle-horses, one of the party by turns having to walk. As the season was rapidly advancing, we could not venture to incur any delay, much as the horses required rest, and accordingly resumed an east course late in the day. At 5 miles came upon a sandy stream-bed, 50 yards wide, trending to the north-east, beyond which the country opened out into an extensive plain of white waving grass—to the north uninterrupted by a single elevation; while to the east and south, at 8 or 10 miles distant, rose ranges of granite hills, capped with horizontal sand-

stones. It was not until some time after dark that we arrived near the opposite edge of the plain, when we came upon a river, 200 yards wide, running to the northward. The long drought had reduced it to a few shallow pools, running from one to the other through the deep sand in the bed; magnificent cajuput-trees lined the banks, and grass was in abundance. (*Camp 71.*)

30th.—We did not start till late, as Mr. Brown had to go back some little distance for his horse, which had been again left behind over-night, knocked up. As it would have been useless, in the present condition of our horses, to attempt at once to enter the ranges to the east, we determined to follow up the river for a few days to the s.s.e., and by so doing secure feed and water, and give the poor animals a chance of recovering their strength; we therefore followed the river up for 7 or 8 miles, through fine open forest country, and encamped near a deep pool, in which were caught ten or twelve dozen of small trout, which, with cockatoos and ducks, afforded an important addition to our ration of only seven ounces of meat. This river was named the Oakover. (*Camp 72.*)

31st.—For nearly 10 miles the river continued to lead us to the eastward of south; it then divided, the main channel coming from the south-west; we, however, followed the eastern branch until quite satisfied that it contained no water, and then fell back to the westward, striking the river near some cliffs, at the foot of which water was plentiful. Although only 1 p.m., I determined to halt for the remainder of the day, as it was too late to make an attempt to enter the hills without giving the horses the advantage of some hours' feed and rest. It also afforded me leisure to make astronomical observations and work up the plans of our route. A set of lunar distances, very carefully taken, placed the camp in long. $121^{\circ} 3' 30''$ E., while that by account, carried on by triangulation and dead reckoning from the Sherlock, placed us $4\frac{1}{2}$ miles more to the westward; the latitude being $21^{\circ} 23' 43''$. (*Camp 73.*)

September 1st (Sunday).—Read prayers.

2nd.—A march of 3 hours across the plains to the eastward brought us to the foot of the range, which we entered by a tolerably easy pass, and soon came upon a pool of water in a tributary to the Oakover, the mouth of which had been passed on our ascent of that river. Here we halted for two hours, and then resumed our route through steep and rocky hills, containing numerous fine springs. It was not until 7 p.m. that we finally got through the ranges, and emerged upon open sandy plains of vast extent, no object being observable from N.N.E. round to s.s.e., except low ridges of red drift-sand, in many parts nearly bare of vegetation. A large party of natives were encamped upon the watercourse down which we descended to the plain. Not wishing to alarm them, we passed the water-holes from which they were supplied, and pro-

ceeded a mile farther, but had in consequence to encamp without water, although amongst abundance of grass. (*Camp* 74. Lat. $21^{\circ} 21' 30''$.)

3rd.—This morning we returned to the native encampment for water, and found that they had already deserted it, leaving many of their things behind—amongst others, a very singular headdress, shaped like a helmet. It consisted of a circular band, made of twisted grass, the size of the head, into which were stuck ten or twelve upright twigs, brought together into a point 2 feet high, which was woven like an open basket, with yarn made of opossum-fur; the whole, no doubt, being considered highly ornamental by the wearers, but of not the least service as an article of protection for the head, either from the sun or in war. Having watered the horses, we entered the sand-plain, travelling between the ridges, which ran in straight lines parallel to each other, at the distance of several hundred yards apart, the sand being thrown by the south-east gales into acute ridges, 30 to 60 feet high, their direction being almost invariably N. 109° E. Travelling to 25 h. 15 min., P.M., we got over about 18 miles, the valleys yielding little else but triodia, with occasional patches of stunted gum-forest, in which was found a little good grass, on which were feeding flights of pigeons and a variety of parrot, new to us, but which I believe to be the “golden-backed” parakeet (*Psephotus chryspterygius*) of Gould. As no water could be found, and many of the horses gave signs of being greatly distressed, no change being observable in the country for many miles ahead, a few very distant ranges being the only objects visible, we were obliged to have recourse to the only safe expedient of falling back and forming a depôt. Resting to 5 h. 10 m., we commenced a retreat until 7 h. 20 m., having been obliged to abandon a horse of Mr. Brown's, quite exhausted. (*Camp* 75.)

4th.—At 6 h. 30 m. resumed our retreat, and by noon arrived at the water-hole of the 2nd, having left two more horses behind, which, however, Mr. Brown and myself carried out water to in the course of the evening and drove them in during the night.

5th.—Leaving the party to rest, I walked 10 or 12 miles round to the south-south-eastward along the foot of the range in search of water, and to ascertain if a better line of country could be found in that direction: but it continued to maintain the same arid appearance, and I only came on one pool, in a gully about 4 miles from the camp. (*Depôt.*)

6th.—Leaving Mr. Turner and four of the party in depôt, with instructions to remain there 3 days, and then fall back upon the Oakover, where there was much better feed, I started with Messrs. Brown and Harding, taking 6 of the strongest horses, 16 days' rations, and 6 gallons of water, and steered S.S.E. along the ranges

for 6 or 8 miles, looking for some stream-bed that might lead us through the plains, but was disappointed to find that they were all lost in the first mile after leaving the hills, and as crossing the numerous ridges of sand proved very fatiguing to the horses, we determined once more to attempt to strike to the eastward between the ridges, which we did for 15 miles, when our horses again showed signs of failing us, which left us the only alternative of either pushing on at all hazards to a distant range that was now just visible to the eastward, where, from the numerous native fires and general depression of the country, there was every reason to think a large river would be found to exist, or to make for some deep rocky gorges in the granite hills 10 miles to the south, in which there was every prospect of finding water. In the former case the travelling would be smoothest, but the distance so great that, in the event of our failing to obtain water, we probably should not succeed in bringing back one of our horses; while in the latter we should have to climb over the sand-ridges, which we had already found so fatiguing. This course, however, involved the least amount of risk, and we accordingly struck south 4 miles, and halted for the night. (*Camp 76.*)

7th.—The horses did not look much refreshed by the night's rest: we therefore divided 3 gallons of water amongst them, and started off early, in the hope of reaching the ranges by noon; but we had not gone 3 miles when one of the packhorses, that was carrying less than 40 lbs. weight, began to fail, and the load was placed upon my saddle-horse. It did not, however, enable him to get on more than a couple of miles farther, when we were compelled to abandon him, leaving him under the shade of the only tree we could find, in the hope that we might bring back water to his relief. Finding that it would be many hours before the horses could be got on to the hills, I started ahead on foot, leaving Messrs. Brown and Harding to come on gently, while I was to make a signal by fires if successful in finding water. Two hours' heavy toil through the sand, under a broiling sun, brought me to the ranges, where I continued to hunt up one ravine after another until 5 P.M. without success. Twelve hours' almost incessant walking, on a scanty breakfast, and without water, with the thermometer over 100° of Fahrenheit, began to tell upon me rather severely; so much so, that by the time I had tracked up my companions (who had reached the hills by 1 P.M., and were anxiously waiting for me), it was as much as I could do to carry my rifle and accoutrements. The horses were looking truly wretched, and I was convinced that the only chance of saving them, if water was not found, would be by abandoning our packsaddles, provisions, and everything we could possibly spare, and try and recover them afterwards if practicable; we therefore encamped for the night on

the last plot of grass we could find, and proceeded to make our arrangements for an early start in the morning. There was still remaining a few pints of water in the kegs, having been very sparing in the use of it; this enabled us to have a little tea and make a small quantity of damper, of which we all stood in much need. (*Camp 77.*)

8th.—At 4 A.M. we were again up. Having disposed of our equipment and provisions, except our riding-saddles, instruments, and firearms, by suspending them in the branches of a large tree, we divided a pint of water for our breakfast, and by the first peep of dawn were driving our famished horses before us at their best speed towards the *depôt*, which was now 32 miles distant. For the first 8 miles they went on pretty well, but the moment the sun began to have power they flagged greatly, and it was not long before we were obliged to relinquish another horse quite unable to proceed. By 9 A.M. I found that my previous day's march, and the small allowance of food I had taken, were beginning to tell upon me, and that it was probable I could not reach the *depôt* until next morning, by which time the party left there were to fall back to the Oakover; I therefore directed Mr. Brown, who was somewhat fresher than myself, to push on for the camp and to bring out fresh horses with water, while Mr. Harding and myself would do our best to bring on any straggling horses that could not keep up with him. By dark we had succeeded in reaching to within 9 miles of the *depôt*; finding unmistakeable evidence, towards evening, of the condition to which the horses taken on by Mr. Brown were reduced, by the saddles, guns, hobbles, and even bridles, scattered along the line of march, which had been taken off to enable them to go on a few miles farther.

9th.—At dawn, Mr. Harding and myself got up from our beds of sand, stiff and giddy, but much refreshed by the cold night-air. In 4 or 5 miles we met Mr. Brown with fresh horses and a supply of water, having succeeded in reaching the *depôt* at 8 P.M. the night before, with only one horse. We were now enabled to proceed with the tracking up of the horses left over-night, which, after resting some hours, had commenced to ramble in search of water; Mr. Brown returning on our route and recovering the saddles and firearms left the previous evening, the stores abandoned the day before being too far off to attempt their recovery. By 8 h. 30 m. P.M. we had all returned to the *depôt*, having tracked up the three missing horses, the two left at the farthest point being too distant to carry relief to without incurring the risk of further loss. I cannot omit to remark the singular effects of excessive thirst upon the eyes of the horses; they absolutely sank into their heads until there was a hollow of sufficient depth to entirely bury the thumb in it, and there was an appearance as though the whole of

he head had shrunk with them, producing a very unpleasant and ghastly expression. (*Depôt Camp.*)

10th.—We were only able to move the camp a mile to another water-hole, for the sake of a little better feed. (*Bivouac.*)

11th.—On taking into consideration the reduced number and strength of our horses, it was quite evident that we had but little prospect of being able to cross the tract of dry sandy country that had already occasioned us so much loss and trouble; yet there were many reasons to stimulate us to make the attempt. Not only had we now attained to within a very few miles of the longitude in which, from various geographical data, there are just grounds for believing a large river may be found to exist, draining Central Australia, but the character of the country appeared strongly to indicate the vicinity of such a feature; added to which, the gradual decline in the elevation of the country, notwithstanding our increasing distance from the coast, tended towards the same conclusion. Nor should we omit the strong evidences, that the remarkable ridges of drift-sand which encumbered the plains must, in the first instance, have been brought from the interior by water, and then have been blown by the strong prevailing south-east winds across the country, in a direction at least 50° from that which they originally came from. This, with the clean, waterworn appearance of the sand, the bold outlines of the hills seen to the far east, and the number of native fires observed in the same direction, must all tend to support the hypothesis that the western half of Australia is probably drained by a large river in about this meridian. I could not, therefore, help regretting, more than ever, that we should be driven back at such an interesting spot, but mature reflection convinced me that any further attempt, with our present means, at this period of the year, was almost certain to be attended with the most disastrous results. I therefore decided upon adopting the only other useful course open to us—that of examining down to the sea the rivers already discovered. With this in view, we to-day fell back 5 or 6 miles across the ranges to a tributary to the Oakover called the Davis, when one of the horses became so crippled by a strain in the loins that we were obliged to halt to give him a chance of recovery; affording me leisure to verify our position by observing another set of lunar distances, which I found to agree well with those formerly taken 10 miles to the westward. (*Camp 78.*)

12th.—We commenced the descent of the Davis, having much difficulty in getting along the sick horse, as it required the united strength of the party to lift him on his legs every time he fell, which he at last did so frequently that I ordered him to be shot, as it was hopeless to attempt to bring him on, and, if left, he must have died of starvation. By 2 P.M. we reached the junction of the

stream we were upon with the Oakover, and halted 2 miles south of Camp 72, most of the party being now dismounted, and shoe-leather was beginning to get very scarce with us. (*Camp 79.*)

13th.—This day we only travelled 8 miles down the Oakover, and encamped near a deep creek, in which was caught a good haul of fish. (*Camp 80.*)

14th.—The feed was so good on this river that we were able to proceed to-day to latitude $20^{\circ} 59' 33''$; the country improving much, grassy flats extending for some miles to the northward; the channel of the river being augmented by the junction of the large tributary crossed on our eastward track on the afternoon of the 29th of August. (*Camp 81.*)

15th (*Sunday*).—Remained in camp to rest the horses. A few natives were seen near the camp during the day.

16th.—After running 4 or 5 miles farther north, the Oakover turned to the north-west for 14 miles, having a clear sandy or stony bed from 150 to 200 yards wide, water and grass being plentiful, and the country generally being open forest, with a pleasing appearance. (*Camp 82. Lat. $20^{\circ} 46'$.*)

17th.—The course of the river was followed for about 17 miles in a westerly direction, the bed widening out to 300 or 400 yards, the water being now confined to a sandy channel not above 150 yards in width, the depth of the valley through which it runs being about 40 feet; timber of white gum and cajuput is tolerably plentiful on the banks, the soil of which is a red loam of considerable depth. Many of the pools are lined with tall reeds. (*Camp 83. Lat. $20^{\circ} 41' 32''$.*)

18th.—Started at 6 h. 40 m. A.M., and in $2\frac{1}{2}$ hours entered a deep and wild-looking gorge, at which point it formed a junction with the DeGrey, coming from the s.s.e., through a beautiful level tract of open grassy country, a broad belt of flooded gum-trees growing for some distance back on either side. Passing through the gorge, which was a quarter of a mile wide and about a mile long, we came upon a camp of natives, who, as usual, quickly dispersed without giving us an opportunity of showing them that we intended them no harm. The river here contains a fine reach of deep water, upon which was a large quantity of whistling ducks and other water-fowl. Two miles lower down we halted on the banks of a deep creek coming in from the northward; the rest of the day being employed restuffing packsaddles, &c., while some of the party caught a quantity of fine fish—amongst them an eel, which, however, was allowed to escape, being taken for a water-snake by one of the party who had never seen one before. A large kind of bat, or vampire, was first observed here, measuring about 2 feet across the wings. (*Camp 84.*)

19th.—We continued to follow down the DeGrey for about 18

miles in a W.N.W. direction, through open grassy plains extending for many miles on either bank, the channel of the river still maintaining the same sandy character, and with abundance of water in its bed. (*Camp 85. Lat. 20° 36' 30".*)

20th.—There was little or no change in the appearance of the country for the 18 or 20 miles that the river was traced down during to-day. We encamped on the bank of a wide and deep reach of water, more than a mile long, surrounded by tall reeds. Fish were caught here in great abundance. (*Camp 86. Lat. 20° 31' 48".*)

21st.—Shortly after starting, we crossed the bed of a tributary coming in from the southward, with a shallow sandy channel, 200 yards wide, which must drain the high ranges between the DeGrey and Shaw rivers, which we passed over on our outward track. In many places we began to observe patches of triodia in the midst of the alluvial plains through which the river continued to run, and distant ranges were observed both to the north and south. Towards sundown we surprised a large party of natives encamped in a dry channel of the river, and approached so near before we were discovered that we had separated a young child from the rest of the party, which was observed by the mother, who remained while the rest of the natives made a hasty retreat; it was not long, however, before an aged warrior returned to her aid, with his spear shipped, and came forward in a very menacing attitude to recover the child, who stood by us with a look of the most perfect unconcern. Finding we took no notice of his threats, he threw down his weapon, and, walking up to the boy, caught him up in his arms and bore him off with a look of triumph to his companions. No attempt was made to carry away their supper, which was ready prepared in a number of wooden scoops, and consisted of fish, rats, beans, grass-seed cakes, and a beverage made with some oily seed, pounded. Leaving everything undisturbed, we pushed on for another mile, so as to prevent their being afraid of returning to their evening repast. (*Camp 87. Lat. 20° 25' 15".*)

22nd.—Being Sunday, we only moved a mile lower down the river to a fine reach of water, on the banks of which was a rich sward of green grass for our horses. Shortly after we had made ourselves comfortable for the day, we were startled by six of the horses coming into camp at a gallop in their hobbles, followed by eighteen armed natives. Every one sprang to their arms in a moment, which caused the intruders to fall back. I tried to make them comprehend that we did not approve of the horses being hunted, but as they would not go away, and they had a stronger party concealed in the brushwood, I fired at a tree to show them the use of our arms. The moment they heard the report of the rifle and saw the splinters fly they took to their heels,

and did not again trouble us. We afterwards found a spear sticking in the ground in the track of the horses, having evidently been thrown while in pursuit. (*Camp* 88. Lat. $20^{\circ} 25'$, long. $119^{\circ} 21'$.)

23rd.—The river soon passed round the southern foot of a range of hills of 400 or 500 feet elevation, the country to the south again becoming very fertile, and clothed with a rich sward of kangaroo-grass. At 10 miles we struck the Shaw River, coming from the south-east, with a broad, deep, and well-defined channel, in which were many fine pools of water. Below the confluence of the rivers the DeGrey widened out considerably, turning rather more to the northward, and 7 miles farther was joined by the Strelley, in lat. $20^{\circ} 16'$, and long. $119^{\circ} 5' \text{ E.}$; the river being diverted to the northward by a rugged range of volcanic hills; its course being now direct for Breaker Inlet, which was distant about 18 miles. (*Camp* 89.)

24th.—As it was very important that I should obtain a round of bearings before proceeding any farther, the country having for some days past been too flat to afford many opportunities for triangulation, I to-day started with Messrs. Harding and Brown to ascend the ranges that lie to the west of the river. A scramble of 3 miles over very rugged rocks brought us to the highest point, which was found to be not more than 500 feet above the sea; our journey, however, turned out to be fruitless, the magnetic attraction of the volcanic rocks of which the hills are composed being so great as to reverse the needle, which varied so much that I could not even make use of the compass to take angles, and I had omitted to bring a sextant. Kangaroo were numerous among these hills, but we did not succeed in shooting any; they appear to be similar to those seen on the plains near the Sherlock. The view we had of the country was very extensive. To the south is a vast gently-undulating plain, only occasionally interrupted by detached granite and sandstone peaks; while narrow green lines of trees intersecting the plain in various directions indicate the watercourses coming from the distant ranges, and wander in wide sandy channels towards the sea; the course of the Strelley being easily distinguished for many miles. To the north the eye could trace the broad sandy bed of the DeGrey, trending towards Breaker Inlet, the position of which was only distinguishable by the margin of deep-blue mangroves that line it, and the whole extremity of the delta formed by the alluvial deposits brought down by the river. To the east and west of this is a wide expanse of alluvial flats, covered in most parts with rich waving grass, the sameness of the scenery being relieved by detached patches of open park-like forest of flooded gum. Returning to the camp by noon, the remainder of the day was devoted by me to bringing up the arrears of mapping,

&c., and by the party generally in providing a supply of fish and ducks, which here were found to be very plentiful.

25th.—By 7 A.M. we were once more tracing down the DeGrey through the flats seen yesterday. At 8 miles the river divided into two channels of nearly equal width, the eastern one being followed to lat. $20^{\circ} 5' 16''$, travelling being very heavy, on account of the numerous rat-holes that completely undermine the banks of the river for more than a quarter of a mile back on either side. For the last few miles the water in the river was decidedly brackish, and at our camp was evidently influenced by the tides; we, however, procured some tolerably good water by sinking a well in a sand-bank in the dry portion of the channel, which here was about 300 yards wide. (*Camp 90.*)

26th.—This morning we found the water in the well quite salt, in consequence of the tide having risen during the night; and as our horses required water, it was found desirable to fall back upon some of the fresh pools to form a camp, while a day or two could be devoted to the examination of this fertile and interesting tract of country. We accordingly crossed the channel and proceeded westward for nearly 3 miles, when we came upon the other branch, which proved eventually to join again several miles below, forming an island, containing some 8,000 or 9,000 acres of alluvial flat soil, covered with a quantity of mixed grasses. To this was given the name of Ripon Island. The western channel was found to be over 300 yards wide, and to contain several fine reaches of open water, some fresh and others slightly brackish; they all were teeming with ducks and a great variety of waterfowl. Having selected a suitable spot for a camp, I started with Messrs. Brown and Harding to examine the country towards the inlet. At a little more than two miles we crossed the river between two pools of salt water, subject to the influence of the tides, and proceeded northward over an open grassy flat for two miles farther, when the grass gave place to samphire and small mangrove bushes, which gradually thickened to dense mangroves, cut up by deep muddy creeks, which put a stop to proceeding farther in that direction. Here we observed several remarkable stacks of dead mangroves, evidently piled together by the natives, but for what purpose we could not ascertain, unless to escape upon from the tide when fishing. Having gained firm ground, we made a *détour* more to the eastward, and at last succeeded in reaching the bank of the river close to the head of the inlet. The tide being at the ebb, I was able to walk over the mud and sand to the mouth of the river, and obtain bearings to Points Larrey and Poissonier, and observe the character of the entrance, from which I formed the opinion that the breakers seen by Captain Stokes when surveying this portion of the coast, and which deterred him from entering the inlet, were

nothing more than the sea-rollers meeting a strong ebb tide setting out of the DeGrey, possibly backed up by freshes from the interior, which would, from a river of this size, occasion a considerable commotion, where the tide amounts to 20 feet ; at any rate I could not observe any rocks, and there appeared to be a channel with at least 5 or 6 feet of water in it at low tide. For the first mile the river has a breadth of from 400 to 800 yards, and would admit, with the tide, vessels of 12 or 14 feet draught of water with perfect safety up as far as Ripon Island, where they could lie completely sheltered in all weathers quite close to the shore, which here has steep banks 20 to 30 feet high ; they would, however, be left aground at low water, as we did not observe any deep pools in this part of the river. I had only just time to complete my observations when the roaring of the in-coming tide warned me that no time was to be lost in returning to the horses, which were nearly a mile higher up the river. Although I ran part of the way, the mud creeks filled up so rapidly, that there was some risk of my being cut off from the shore, and having to take up a roost on the top of the mangroves until the tide fell ; I had time, however, to observe that the head of the tide carried with it thousands of fish of great variety, amongst them a very remarkable one from 3 to 6 inches in length, in form resembling a mullet, but with fins like a flying-fish ; it is amphibious, landing on the mud and running with the speed of a lizard, and when frightened can jump 5 or 6 feet at a bound ; I did not, however, succeed in capturing one for a specimen. Swarms of beautiful bright crimson crabs, about 2 inches diameter, were to be seen issuing from their holes to welcome the coming flood, on which was borne a great number of sea-fowl, which, it was evident, came in for an abundant feast in the general turmoil. Mounting our horses, that had stood for the last two hours without touching a mouthful of the rank grass around them for want of water, we returned to the camp by a different route, through open grassy flats bordering the deep reaches of water that encompass the n.w. side of Ripon Island.

27th.—Accompanied by the same party, but with three fresh horses, we again started to explore the plains eastward towards Mount Blaze. For several miles after leaving the island the country continued of the same fertile character as that passed over yesterday, and is at times subject to inundation from the river ; but as we receded from the influence of the floods the soil became lighter and the grass thinner, with patches of triodia and samphire. At 12 miles we entered a patch of open grassy forest, extending for some miles, but as there was no promise of obtaining water, and the day was calm and sultry, we turned to the northward, in the hope that water might be procurable under the low sand-hills that line this portion of the coast ; in this we were, however, disappointed,

as the fall of the country terminated in mangroves and salt-water creeks, between which and the sea is a narrow ridge of low sand-hills. Amongst them we observed many tracks of natives, but did not discover any water. The sea here is apparently very shallow for many miles off-shore, more than half a mile of mud and sand-bank being left dry at low-water. Resting the horses for two hours we returned to camp by a more direct route, passing for several miles over a plain of rich black mould, covered with a short sward of bright green grass, the native fires having swept off the dry grass a few weeks previously; and although there had been no rain since, the heavy dews that fall during the night in these latitudes had been sufficient to produce a rapid growth.

28th.—As I expected to meet with some difficulties for want of water between this and the Yule River, I thought it best to give the horses the benefit of a little rest before resuming our homeward route. Some of the party were also deriving much benefit from the abundance of fresh game, as they had been suffering from debility, brought on most probably by over-exertion while traversing the heavy country of the interior. While here we obtained several additions to our small collection of birds—amongst them a beautiful wader, the size of a large snipe, the head being covered by a remarkable membraneous hood or sheath of a rich gamboge yellow, resembling the leaf of a flower falling back from the beak, and lying close over the feathers, protecting them when the beak is plunged into the sand after food; they had also a remarkable sharp horn or claw projecting forward from the last joint of the wing, with which they can fight when attacked by birds of prey. A very handsome bird was also shot, resembling a flamingo: the body being about the size, and in plumage like a pelican; the head and neck of a deep rich purple, and formed like the flamingo; the legs bright red, long and slender; it flies extended to its greatest length, measuring 6 feet 2 inches, and across the wings 7 feet 2 inches; its weight being only 11 lbs. A white heron, with bird-of-paradise feathers on its back, was occasionally seen, but only one specimen procured.

29th (Sunday).

30th.—We made an early start up the river, and at 3 miles struck out into the plains to the westward, where we found a large extent of open flat, yielding grass and atriplex, and timbered in many parts with flooded gums. At 10 miles we came upon a deep reach of water flowing to the north-west, which must empty itself into the sea 4 or 5 miles to the south-west of Spit Point, forming an island of a portion of the delta of the DeGrey, containing between 90,000 and 100,000 acres of alluvial land. This channel was followed up, and found to come from the river, close to the junction of the Strelley, and must be a very considerable outlet for

the water during the summer rains. I regretted much not having time to trace this branch of the DeGrey to its mouth, as it might be found to be navigable, and afford a fine site for a seaport town. Fresh water is abundant, and building stone procurable in any quantity, being found in the immediate vicinity, on land superior to inundation. We remained at the junction the rest of the day. (*Camp 92.*)

October 1st.—As the plains were now dry and parched, we determined to follow up the Strelley to the ranges before striking west to the Yule. At first the river spread out into so many wide grassy channels that it was difficult to trace it; but at 4 or 5 miles collected into one bed, about 100 yards wide, in which were a few small pools. Up to this point the country had been fertile, the soil being an alluvial clay, resulting from volcanic rocks; but after getting clear of the line of hills the soil became poor and hungry, yielding little else but triodia and acacia-bushes. Water was procured in several places in the course of the day's march, our course having been nearly due south. (*Camp 93. Lat. 20° 32' 30".*)

2nd.—The river led us this morning a little to the eastward of south, through a country very similar to yesterday. Late in the day we crossed a considerable tributary coming from the south-east, which was now quite dry, and takes its rise in a bold range of granite-hills now visible to the southward, at the distance of 10 or 12 miles, and forms a part of the main table-land of this part of the coast; the plain we had been passing over being only a sea flat, with a few detached ranges widely scattered over its surface. The river now began to trend to the westward, granite rocks showing themselves on the surface in large masses. Water was occasionally procurable, which was very important, as the horses could not travel many hours without it, although the heaviest packs were reduced below 100 lbs. We had now only 6 saddle-horses, so that two of the party had to walk by turns for an hour at a time. We halted late in lat. 20° 45' 17". (*Camp 94.*)

3rd.—Started at 6 h. 30 m., and in an hour came upon a fine pool in the granite, which was very acceptable, as we had encamped over-night without any water. The channel of the river here deepened considerably, was full of rocks, and contained plenty of water. Skirting the ranges for some distance several tributaries joined from the southward. The country, although rocky, improved much in general appearance; grass was abundant, and game frequently met with. At night we encamped on a small pool in the bed of the river, about 5 miles from the foot of the range. Cockatoos and pigeons came in great numbers to drink at the pool about sundown. (*Camp 95. Lat. 20° 56' 33", long. 119° 10" by account.*)

4th.—Made an early start, and travelled 4 miles on a south-west

course, when the river divided into two channels, the main one coming from a deep gorge to the S.S.E., exactly in the direction in which we had left the Strelley on our outward route, at a distance of about 30 miles, identifying the stream with some degree of certainty. Taking the western branch, which would lead us towards the Yule, we followed it up until long past noon into a hilly country, without meeting with water; we, however, saw a large extent of fine grazing-land, which would make an excellent summer station when the flats were inundated. Having rested during the heat of the day, which had lately become rather oppressive, we resumed a westerly course, having run out the head watercourses of the western branch of the Strelley. A few miles brought us to a considerable stream-bed trending to the north-west, which was followed down till some time after dark, having procured a few gallons of water from a native well in the bed of a creek. To-day we had travelled for nine hours, and accomplished a distance of 22 miles, the longest day's march we had made for many weeks past. Early in the day we had noticed what we took for a great number of native fires springing up in all directions, and quickly to die away again; we, however, found it to be a number of whirlwinds, carrying with them huge columns of charcoal and dust, which traversed the plains sometimes for miles before they broke. (*Camp 96. Lat. 21° 4'.*)

5th.—Our computed distance from the Yule was now only 21 miles, and the country promised well for travelling, but the long march yesterday and the short allowance of water rendered it very doubtful whether some of the horses would hold out long enough to reach it; we therefore had our breakfast before daylight, and as soon as we could see resumed our route to the westward. At 5 miles we crossed a sandy channel 200 yards wide, full of cajeput and gum-trees; but as we did not soon find any water in it, pushed on at a rapid pace, and in 2 miles crossed a similar channel, 100 yards wide, trending north-west, and running parallel to the first. Beyond this the ground became rocky for a few miles, and by the time we had gone rather more than 12 miles, Mr. Burges's mare, Lucy, could go no farther. Giving her half a gallon of water out of the little stock carried with us, I left Messrs. Brown and Harding to bring her on when rested, and with the rest of the party continued our route. A mile or two farther, and another horse, Bob, was knocked up and left behind, having also had some water given him. With considerable difficulty we succeeded in getting the rest of the horses on to the Yule by 1 h. 30 m. P.M., making it close to our camp of 13th August. Had the distance been 10 miles farther, probably not more than three or four of the horses would have ever reached it, so much were they reduced in strength. On reaching the pool several of the horses, notwithstanding our efforts to prevent them,

rushed headlong into the water with their packs on, and drank so much of it that it was with great difficulty we could drag them out again. In the course of the afternoon Messrs. Brown and Harding came in with the horse Bob, but had not been able to get the mare on more than 2 or 3 miles. Being anxious, however, not to lose her, I sent M'Court and James with two of the strongest horses, carrying 4 gallons of water for her, after which they succeeded in getting her into camp by midnight. (*Camp 97.*)

6th (*Sunday*).—Moved a short distance down the river to Camp 57, for better feed.

7th.—As the distance from the Yule to the last known permanent water on the eastern branch of the Sherlock is over 25 miles, and our means of carrying water very limited since abandoning our largest pair of kegs in the retreat on the 8th September, I to-day set to work and soldered up a number of preserved-meat tins that had been carefully opened and kept for this purpose, putting a small spout to each. Eight of these (4-lb. tins) we found to contain something over 4 gallons, which, added to our water-belts and the two remaining kegs, would provide for the conveyance of 12 gallons of water, which I hoped would prove sufficient to enable us to pass the dry tract of country in safety, as it would allow half a gallon to each horse, and an ample supply for the party for two days. I also succeeded in repairing the aneroid barometer, which had been crushed nearly flat by the fall of a horse; fortunately, however, without injury to the vacuum vase.

8th.—Having rearranged the loads and lightened them by leaving hid amongst the rocks a pack-saddle and 60 lbs. weight of horse-shoes and nails, at 3 h. 45 m. P.M. we commenced a retreat on our outward tracks of the 13th August, travelling to 7 h. 15 m., when we encamped on a patch of tolerably good grass in the plain at the foot of a volcanic range, without any signs of water near us. (*Camp 98.*)

9th.—We were up before daylight, and by 6 had our breakfast, and were again on our march, visiting a water-hole seen on our outward route, but now found to be quite dry. We pushed on at the best speed of our horses, which was now not much over 2 miles an hour, to 10 h. A.M., when the heat of the day began to tell on the jaded animals; we therefore halted for an hour, to give the horses half a gallon of water each, after which they travelled on much more briskly, so that by a little past noon we succeeded in reaching the large pool in the eastern Sherlock, near Camp 55. Some of the horses were, however, so much exhausted that we had some difficulty in getting them to move for the last mile, although entirely relieved of their loads. (*Camp 55 A.*)

10th.—Although the horses were by no means in a fit state to

continue the march, yet grass was so scarce, on account of the native fires having here swept it off, that we found it best to push on for the springs at Camp 52.

Following down the banks of the stream we found several pools not yet dried up, which proved a great help to our horses. Before noon, however, the mare Lucy again gave in, and was finally abandoned, as there was but little chance of her ever reaching the Bay; it is possible she may live to be picked up by some future travellers, although too old to last many years. By 1 P.M. we reached the springs at Camp 52, and found an ample supply of water, but the grass was here also much parched up; we, however, remained for the rest of the day.

11*th*.—This morning our route was resumed down the eastern Sherlock, tracing a portion that had not been before examined, and which was now found to be well supplied with water and grass; cockatoos and pigeons being seen in large numbers, feeding on the banks. As we approached the junction of the two branches of the river we met a party of 10 or 12 natives, who came boldly up to us, which was the only time we had known them to do so since quitting Nickol Bay. Hoping to gain some useful information from them, they were allowed to follow us to our old camp of 2nd August, where there are the large fish-pools, of which they gave us the native names. We were not quite so successful in procuring game here as on the former visit, although as much fish was caught as could be consumed while it was good. The natives kept rather aloof while we were shooting on the river, but about dusk 8 or 10 came to the camp, unarmed, evidently on a thieving excursion; and, although narrowly watched, managed to carry off a portion of Mr. Hall's kit, which, however, he recovered next morning, on paying them an early visit, finding the articles buried under some rushes in their camp.

12*th*.—We were now getting so near our destination, that although provisions were running low, we could afford to give the party a whole day's rest, while I was enabled roughly to plot out some more of my work and write up the journal, which, from having my time constantly taken up with more pressing duties, had fallen sadly into arrears. The natives again came to see what they could steal, but this time were made to sit outside a line drawn on the sand, some 20 paces from the camp—an agreement they appeared highly to disapprove of, giving expression to their dissatisfaction in a manner anything but polite; finding, however, that we were inattentive to their impertinence, so long as they confined it to harmless display, they watched their opportunity, and suddenly set fire to the grass in several places at once around the camp, and ran off as hard as they could. As this was an open act of hostility that it was necessary they should be chastised for,

although I did not wish seriously to hurt them, they were allowed to run to a suitable distance, when a charge of small shot was fired after them, a few of which taking effect on the rear of the principal offender, induced him, on meeting some of the party out shooting, to make an apology, and try to lay the blame of the theft of the previous day on the dogs!

13th (*Sunday*).—As the distances between the several watering places on the homeward route were too much to perform without intermediate halts, and the heat of the noon-day sun rather oppressive, it was found better to start from the pools late in the day, so as to make the halts without water during the cool of the night, travelling only very late in the evening and early in the morning. We accordingly did not start this afternoon until 4 P.M., and travelled on to 8 h. 45 m., encamping in an open grassy plain under Black Hill—a volcanic eminence, the position of which is shown on the Admiralty charts. (*Camp 99.*)

14th.—By 6 h. we were again on the move, and in an hour gained the banks of the George, which takes its rise in the volcanic hills to the southward. In its channel was an abundant supply of water, with many fine healthy trees overshadowing the pools. By 9 we arrived at our old camp (50) where we rested to 4 h. 15 m., when we resumed and travelled on to nearly 8 P.M., encamping on the open grassy plains near the Harding River. (*Camp 100.*)

15th.—An early start enabled us to accomplish the remaining six miles to the Harding by 8 h. 30 m., where we halted for the remainder of the day, as it was not unlikely that we might have to travel the remaining 30 miles into the Bay without finding any more water. As we had now only four days' rations left, and it was uncertain, in the present low condition of our horses, how long it might take us to reach the ship, the sportsmen of the party made the best use of the halt to procure game, while I proceeded to convert some more of the empty meat-tins into water-canisters, increasing our means for the transport of water to 18 gallons, with which we had a fair prospect of getting in all the horses, even though no more water should be found on the route. Our camp was enlivened this evening by the continued screeching of a number of large bats, which kept up a vigorous fight in the trees overhead the greater part of the night, notwithstanding our shooting 10 or 12 of them. They were very fat, but emitted such an intolerable odour that it would require even an explorer to be hard pressed before he could make a supper off them, either roast or boiled.

16th.—This morning set in intensely hot, by noon the thermometer standing at 107° in the shade, and at 3 P.M., when placed on a sandbank in the sun, rose to 178° of Fahrenheit; on

the setting in of the westerly breeze it, however, fell at once to 96°, and by 4 h. 30 m. P.M. we were enabled to resume our route without feeling in any way inconvenienced by the temperature. We did not now attempt to pass through the rocky ranges so far to the eastward as on our outward route, but kept more to the westward along the open grassy valley, until opposite the narrowest part of the range, when, turning sharp to the north, we very quickly passed over the rocky portion of the hills, only encountering a few miles of extra rampant triodia, which was anything but pleasant to walk through, especially leading the party after dark. Following down a small watercourse for several miles, it at length joined the Nickol River, in which we shortly after found a small quantity of water, in the bottom of what had been a pool, but which toward the close of the dry season sometimes goes dry; here we halted for a few hours to rest. (*Camp 101.*)

17th.—Without waiting for daylight, by 2 h. 10 m. A.M. we were again on the move, as there was now a fair chance of getting all the remaining horses into the Bay, if we did but avoid travelling during the heat of the day. In an hour the hills were cleared, and it was now all open plain as far as the marsh at the head of Nickol Bay. By the time the morning broke, we were in full view of the Bay and several islands of the Archipelago, the long black hull of our ocean-home riding at anchor on the now placid waters, forming by no means the least pleasing feature of the scene, to those who had not seen a vestige of civilization for many months. After halting for nearly two hours for breakfast, and to distribute the water amongst the horses, we again moved rapidly on, crossing the marsh with some difficulty, owing to the spring-tide having been recently over it, and at 1 P.M. arrived on our old ground at Hearson Cove, where we found a boat and party from the ship waiting for us, James having been despatched by a shorter route to signalize our return. Everything had gone on satisfactorily during our absence. The vessel's water-tanks had been kept filled up, ensuring a supply for our horses on the homeward voyage, as it would be utterly impossible at this season of the year, with the animals in such low condition, to attempt the overland route to Champion Bay. Amongst other discoveries during our absence, was a bed of pearl oysters at the head of the Bay, from which the crew of the *Dolphin* had procured several tons of very fine mother-of-pearl, besides a small number of pearls, varying in size from 1 to 4 carats.

18th.—The party was fully occupied in clearing out the well and packing up saddles and outfit for shipment. It was also found that deepening the well had caused the water to become brackish, so much so that we had to bring water by boat from the spring at which the ship had been filled up; the horses however still managed

to drink the well-water, although it produced great thirst. I have no doubt but that had we had time to sink a fresh well closer to the foot of the hills, we should have obtained fresh water, as several ravines terminate there in a beautiful grassy flat, where a large proportion of the rain water brought down from the hills sinks into the soil, from whence it gradually drains down and supplies the wells in the salt strata. I was disappointed to find that the cotton plants, that had thriven so well on first being sown, had been burnt in consequence of some of the sailors having thoughtlessly set fire to the adjoining grass; had they not been killed, by this time they would probably have been in flower, as their growth was very rapid.

19th.—As it was necessary to give the horses a few days' rest previous to swimming them off to the ship, I started this morning in the life-boat, accompanied by Captain Dixon and Messrs. Brown, Harding, and Walcott, to examine the eastern shores of the bay, for the purpose of ascertaining whether a more suitable spot for a landing-place and site for a future town could be found in that quarter. Leaving the *Dolphin* at 5 h. 30 m. A.M., we ran to the eastward with a light south wind, passing, at 6 miles, two small islands in the mouth of the small bay into which the Nickol River discharges itself. These islands had been visited already by Mr. Walcott, and I gave them the name of Pemberton and Walcott Islands. Continuing to run along the shore towards Cape Lambert, the soundings gave from 2 to 3 fathoms, with a good bottom of mud and sand, but the landing was generally indifferent and rocky, until we came to within about 9 miles of the cape, when a deep opening was passed, affording good shelter and landing for small craft. Two miles farther we landed in a small rocky cove for breakfast, which gave me an opportunity of climbing a hill and examining the surrounding country, which proved very dry and rocky. A little farther we passed a bold headland, against the extremity of which rested a singular flying buttress, forming half an arch of 50 or 60 feet span, and from 30 to 40 feet in height. Turning this headland, another opening was observed, which we entered with the tide, and soon found that it communicated with the first one, forming an island of some extent and elevation, to which was given the name of Dixon Island. We continued to beat down the channel, which had an average width of over half a mile, until late in the evening, when we came to anchor in 11 feet water.

20th.—At daylight we found ourselves high and dry, only a narrow channel a few yards wide being left. Having walked over the mud to Dixon Island to breakfast, the vicinity was examined for water, but without success. At 6 the tide came in again so rapidly, that it was not without some little difficulty we gained our

boat, when the wind set in so strongly from the south-west, that after several hours' almost ineffectual attempts to work to windward, we again landed, not 2 miles from our last night's anchorage, the character of the country being equally unfavourable for landing, as it was cut up by deep mangrove creeks running far up the valleys into the steep rocky hills, forming a difficult and unpromising country. The breeze having moderated and shifted a point more to the westward, we again attempted to beat out into the bay, but by 9 P.M. had not made more than 3 miles, when we landed for the night, leaving two of the party in charge of the boat to keep her off the rocks when the tide fell.

21st.—The wind and tide being now in our favour, by 3 h. 30 m. we took to our boat and arrived on board the *Dolphin* by 10 A.M., when she was very soon got under weigh for the purpose of taking her closer in to ship the horses; light and variable winds, however, prevented our working more than a mile nearer the landing cove by sundown, when we dropped anchor for the night.

22nd.—With a light west wind the *Dolphin* was worked into 11 feet water, $1\frac{1}{2}$ mile off the point near the cove: the vessel drawing over 10 feet, brought the mud up to the surface in our wake. Eight horses were soon swam off without much difficulty, as we all had now some little experience in this sort of work.

23rd.—By 2 P.M. the remaining 6 horses and equipment of the Expedition were all safely shipped, and a conspicuous intimation of our sojourn on the coast having been painted in large white letters on a pile of granite rocks near the south corner of the cove, we took our final departure, getting the *Dolphin* under weigh by 4 P.M., with a light westerly wind, which carried us through the passage between Haüy and Delambre Islands by 7, when we hauled up and stood to N.N.W.

24th.—The wind still holding to the west, we made but little progress, the *Dolphin* being only a good sailer in smooth water, or running before the wind. Lat. $19^{\circ} 12'$ s. at noon.

25th.—By noon observations we were only in lat. $18^{\circ} 42'$, long. $113^{\circ} 32'$.

26th.—The wind veering slightly to the south, we were able to make by noon to lat. $18^{\circ} 46' 30''$, long. $111^{\circ} 47' 30''$.

27th.—From this time to the 3rd November the winds continued to blow almost uninterruptedly from the south and eastward, which carried us as far west as long. 101° E. and lat. 31° s., where we met with westerly winds, which enabled us to run up to within sight of Cape Naturaliste by the 8th.

November 9th.—By 10 A.M. we were off Rottneest Island, when the pilot came on board and took us to the anchorage in Gage's Roads by about noon. Having given instructions to Mr. Turner for the landing of the horses, &c., I landed with Messrs. Brown,

Harding, and Hall, all of whom were, at their desire, at once released from the duties of the Expedition. Proceeded by steamer to Perth.

10th.—Had an interview with his Excellency the Governor, and reported the safe return of the party and general results of the Expedition.

F. T. GREGORY,

Commander N.W. Australian Expedition.

APPENDIX.

ADOPTING the course which I have found most convenient on similar occasions, I now proceed to offer a few remarks on the general features, productions, natural capabilities, &c., of the country traversed by the Expedition, which could not, without disadvantage, have been introduced into the foregoing narrative. These remarks have already appeared at the conclusion of my Report published on the 18th November, 1861, but are equally applicable to the present publication.

Commencing with its geographical and geological peculiarities, that portion of the country which came under our observation consists of a succession of terraces, rising inland for nearly 200 miles, more or less broken up by volcanic hills towards the coast. The first belt averages from 10 to 40 miles in width from the sea, and is a nearly level plain, slightly ascending to the southward, with an elevation of from 40 to 100 feet, the soil being generally either light loam or strong clays, according as it is the result of the disintegration of the granite rocks that occasionally protrude above its surface, or of volcanic rocks of black scoria that frequently interrupt the general level; hills of this nature also constitute the greater portion of the more elevated islands off the coast, Cape Lambert, and the promontory that shelters the western side of Nickol Bay. The generality of these rocks do not, however, yield so rich a soil as might be expected from their origin; this is owing to the absence of actual lava, the eruptive heat having only been sufficient to convert the superincumbent primary and tertiary rocks into a vitreous scoria, having a specific gravity of 3·2, and is highly indestructible in its texture.

Proceeding inland for the next 50 or 60 miles is a granite country that has been originally capped with horizontal sandstones, and has an elevation of about 1000 feet. This range terminates to the southward in level plains of good soil, the produce of the next series of more elevated country, while towards the northern edges the granite and sandstones have undergone great changes through the action of numerous trap dykes that have greatly disturbed its surface, producing metamorphic rocks, some resembling jasper, and others highly cellular and scoriaceous.

In about lat. 22°, on the meridian of Nickol Bay, we came upon another and more elevated range, trending away to the s.e., having an altitude of 2500 feet above the sea. This, unlike the last section, has a southern escarpment of 500 or 600 feet, and consists of horizontal sandstones and conglomerates, which have comparatively undergone little change, and has an average breadth of 8 or 10 miles; the southern flank being bordered by fertile valleys of strong loamy clays, merging gradually to the southward into stony ridges and hills, some having an elevation of nearly 4000 feet, the culminating point being attained at Mount Bruce, in lat. 22° 30'.

From this point the country gradually falls to the Ashburton, the bed of which river, in the same meridian as the bay, is about 1600 feet above the sea,

and the adjoining ranges not above 2200 feet, or about the same as the country on the Gascoyne, Lyons, and Upper Murchison.

Of minerals I was unable to discover any traces, except iron. Quartz-reefs occasionally traversed the country in a N.N.E. and S.S.W. direction, or nearly the same as the mineral lodes at Champion Bay, but I could not find any instance in which this rock offered much to indicate the probable existence of gold, it being far surpassed in this respect by the rocks on the Upper Murchison. Coal does not appear likely to be found within the limits of the country passed over, unless towards the easternmost point attained by the Expedition.

With regard to the harbours on the coast, I can only speak of Nickol Bay and the anchorage under Rosemary and the adjacent islands. The former I consider only second to King George's Sound, as it can be entered in all weathers, either from the north or north-east; and there is reason to believe that a safe passage exists between Legendre and Dolphin Islands, leading into Mermaid Straits, where there appears to be an excellent harbour at all seasons of the year.

The soundings towards the eastern and western shores of Nickol Bay, taken at low water, show sufficient depth for vessels of considerable tonnage to lie within a cable's length of the shore, the bottom being fine sand and soft mud. Towards the head of the bay the water is much shallower, not carrying more than 2 fathoms, 2 miles from the shore. No reefs are known to exist in this bay, except quite close in to land.

In making the running survey of the western promontory I found that all to the north of Sloping Head was an island, having a boat channel, from half a mile to a mile wide; to the outer portion I therefore gave the name of Dolphin Island.

The tides are tolerably regular, and average 16 feet, but at the spring they rise 21 feet; on which occasions the whole of the western promontory, including the high lands for several miles to the westward, is entirely cut off by the sea, the other opening being under Enderby Island—a circumstance that greatly detracts from the value of these otherwise fine harbours, as it would require 2 miles of causeway to connect the best landing-place, where water is to be found, with the mainland.

The average declination of the needle throughout this district I found to be 1° east, the result of many amplitudes and azimuths; there is, however, in the vicinity of many of the volcanic hills, great local attraction.

Of the climate I can only say that during the five months we remained on the coast we never experienced the same inconvenience from it that we frequently have done within the limits of the settled districts of the colony; the weather was, however, principally fine, and the sky clear during our stay, only two showers having occurred—one at the latter end of May and the other in June. The meteorological register kept at Nickol Bay shows the following results, from observations taken at all hours of the day and night:—

					Thermometer.	
					Maximum.	Minimum.
May	..	..	..	..	80	65
June	..	..	..	..	76	63
July	..	..	..	..	78	56
August	..	..	..	..	80	54
September	..	..	..	..	83	65
October	..	..	..	..	92	70

Under the peculiar circumstance of the thermometer being placed on a sand-bank in the sun during the hot days in October, it rose to 178° of Fahrenheit, whilst the lowest it ever fell to was up in the hills in July, when it was 2° below freezing just before sunrise.

The winds continued to blow almost uninterruptedly from the E. and S.E.

during the first four months, veering to the s.s.e. and s., and occasionally to the n.e. Latterly the wind was alternately s.e. in the morning, and n.w. or westerly in the afternoon; the sky becoming frequently overcast, and every appearance of the near approach of the rainy season, which it has been observed by former navigators and explorers to do about the beginning of November, and continue to March.

Amongst the natural productions I would first briefly refer to the beds of the pearl oysters, as they are likely to become of immediate commercial importance, considerable numbers having been gathered by the crew of the *Dolphin* in their leisure time, the aggregate value of which, I am told, is between 500*l.* and 600*l.*; besides pearls, one of which has been valued by competent persons at 25*l.* The limits of the bed are as yet undefined, but there is good reason to believe, from the position of it, that with proper apparatus ships could soon be loaded with them.

Sandalwood was found in small quantities, very highly scented, but too widely scattered to become of much importance as an article of export.

Of indigenous fruits, &c., we observed the *Adansonia*, or gouty-stemmed tree of Sir G. Grey (nearly allied to the baobab or monkey bread-fruit of Southern Africa). Sweet and water-melons, similar to those formerly seen by me on the Lyons River, but of much larger size; a small gourd; a wild fig, well tasted, and a sweet plum, very palatable, were found in tolerable abundance.

I have already spoken of the palms which grow on the bank of the Fortescue; they are very handsome, and grow to the height of 40 feet; but not having brought in any specimens, they have not yet been identified as to their variety.

Tobacco does not grow so luxuriantly here as on the Lyons River, but the natives collect it, and, after preparation, chew it: we did not on any occasion observe them to smoke.

Many beautiful flowers were also collected, which will be forwarded to some of the most eminent botanists, to be described and classified.

It now only remains for me to give an opinion on the capabilities of the country for colonization. It would be almost impossible to particularise the positions or define the limits of country adapted for grazing purposes, beyond the reference already made to them. The total amount of land available for this purpose within the limit of our route I should estimate at not less than two or three millions of acres, and of this I may safely say 200,000 are suitable for agricultural purposes, the greater portion of which lies on the two flanks of the Hamersley Range, on the banks of the DeGrey and its tributaries, and on the Lower Sherlock.

Of the fitness of this district for the growth of wool, for which, on account of its being an intertropical country, it is generally supposed it would be unsuitable, I would remark that its elevation above the sea appears likely to obviate the objection, and render it probable that sheep may not degenerate in the same way they are found to do in other tropical countries; at any rate, flocks are now being pushed over on to the same latitude in Queensland, and we do not hear of the wool-grower complaining that such is the case there.

As to its fitness for the growth of cereals, it is quite possible that wheat and barley may not come to the same degree of perfection they do in the more temperate latitudes of Australia, but there is no reason to doubt its capability of growing sufficient grain for the support of a numerous population.

What it appears more highly qualified for than anything else is the growth of cotton—a question which at the present juncture cannot be lost sight of. From my personal observation of the cultivation of this plant in Egypt, and the attention I have recently paid to this subject while in Europe, I feel confident that a very considerable portion of the arable lands on the DeGrey and Sherlock are precisely the soils adapted for the production of this valuable com-

modity. As, however, I purpose to make this the subject of a more lengthy paper at a future period, I will not now venture to enlarge upon it.

As the number and disposition of the aborigines are likely to have some effect on the first settlement of a district, I would give it as my opinion that these people will not prove particularly troublesome to the settlers, if properly and fairly treated. They are not numerous; they appear very willing to take employ under Europeans, and will no doubt soon be made as useful as in the other districts. In stature they rather exceed the usual standard, some of them measuring two or three inches over six feet.

In bringing my Report to a close, I would wish to observe that, although the results of the Expedition have fallen short of my sanguine hopes with regard to geographical discovery, and will, I am afraid, in some degree disappoint the anticipations of the eminent geographers who have lent their valuable aid in promoting the undertaking, yet I cannot but hope that the large amount of additional fertile country it has brought to our knowledge will compensate in some degree for the deficiency. I am, however, unable to refrain from again expressing my opinion that had not so many concurrent circumstances combined to retard the departure of the Expedition until so late in the season, and if it had arrived on the coast at the time originally recommended by the Geographical Society, it would, in all probability, have resulted in the full accomplishment of the object they had in view.

It now devolves upon me to perform the pleasing duty of recording my entire satisfaction with the manner in which the whole of the members of the Expedition put forward their best energies in the performance of their respective functions. To Mr. Turner I am indebted for the care bestowed on the management of the store department, which came under his immediate charge. To Messrs. Brockman and Hall, J. M'Court, and James, are due my acknowledgments for the cheerful alacrity with which they performed the duties allotted to them.

Of Messrs. Maitland Brown and J. Harding I cannot speak too highly. Accompanying me on all the extra services upon which I was engaged, they had to endure privations of no ordinary description, which they met with a spirit of steady fortitude deserving of the highest praise. To the valuable services rendered to the Expedition and to science by Mr. P. Walcott I have already had occasion to refer, and I sincerely hope that his talents and zeal in the pursuits of Botany and Natural History may meet a more substantial reward than the thanks which are justly due to him and those gentlemen who have given their time and talents gratuitously in the service of their fellow-colonists.

To Captain Dixon and the officers and crew of the *Dolphin* every praise is due for the assistance which on all occasions they promptly afforded in aiding the Expedition, and for which I gladly avail myself of the present opportunity to return them my best thanks.

In conclusion, permit me to tender your Excellency my acknowledgments for the readiness with which you have acceded to my various suggestions, in carrying out the arrangements of the Expedition since the passing of the vote of money in aid by the local Legislature.

F. T. G.
